U.S. POLYMERIC

HITCO MATERIALS DIVISION

FM 5055B LOT #2

D-09274

FINGERPRINT TEST DATA REPORT

NAS8-36298 COPY # 9

TABLE OF CONTENTS

FILLER TESTING

NAS8-36298

U.S. Polymeric O.E. 71108

Filler Lot for NASA Lot# 2

U.S. Polymeric

FILLER TESTING

NAS8-36298

U.S. POLYMERIC O.E. 71108

Filler Lot for NASA Lot# 2

1. Carbon Content, %
   QAI-5560

	SAMPLE #2A-1	#2A-2	#2A-3
	99.31	99.18	99.40
NASA LOT# 2 AVERAGE			99.30

2. Ash Content, %
   PTM-71B

	0.0	0.0	0.0
	0.0	0.0	0.0
AVG.	0.0	0.0	0.0
NASA LOT# 2 AVERAGE			0.0

3. Atomic Absorption, ppm
   CTM-53B
   (Values are average of 2 determinations)

	#2A-1	#2A-2	#2A-3	LOT#2 AVG.
Na	7.0	7.5	9.0	7.8
K	1.5	1.0	2.5	1.7
Ca	2.5	1.5	2.0	2.0
Mg	0.0	0.0	0.0	0.0
Li	0.0	0.0	0.0	0.0
TOTAL	11.0	10.0	13.5	11.5

3a. Moisture Content, %
   CTM-53B

	.041	.034	.039
	.031	.020	.045
AVG.	.036	.027	.042
NASA LOT# 2 AVERAGE			.035

3b. Ash Content, %
   CTM-53B

	0.005	0.000	0.015
	0.000	0.025	0.000
AVG.	0.003	0.013	0.008
NASA LOT# 2 AVERAGE			0.008

4. pH, Units
   ASTM D1512

	4.60	4.40	4.50
	4.60	4.60	4.70
AVG.	4.60	4.50	4.60
NASA LOT# 2 AVERAGE			4.57

5. Particle Size, microns
   S.E.M. procedure
   (Average values are of 20 determinations)

AVG.	.56	.57	.52
Maximum	.90	1.25	1.17
Minimum	.23	.20	.25
Std. Dev	.22	.28	.24
NASA LOT# 2 AVERAGE SIZE			.55

6a. TGA, °C at 50% Loss
   CTM-51

	842	850	857
NASA LOT# 2 AVERAGE			850

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Filler Lot for NASA Lot# 2

6b. TGA
CTM-51

See Charts 6A-6C

7. Particle Size Distribution
CTM-72

See Charts 7A-7C

7a. Particle Size, microns
CTM-72

	#2A-1	#2A-2	#2A-3
	.86	.97	.95
	.85	1.08	.92
AVG.	.86	1.02	.94

NASA LOT# 2 AVERAGE .94

U.S. Polymeric

Hamid M. Qureishi

Hamid M. Qureishi, Manager
Quality Assurance Department

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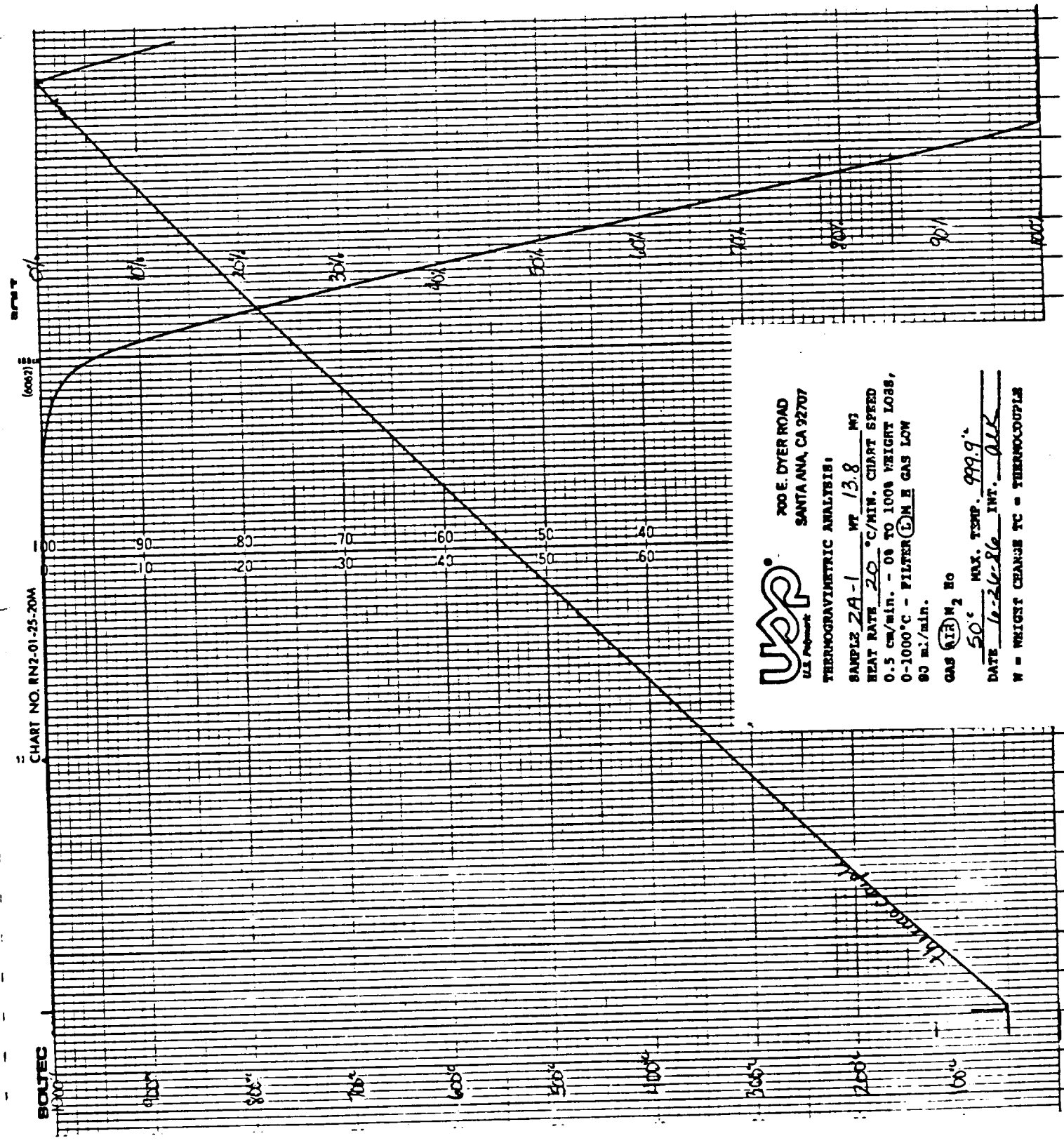
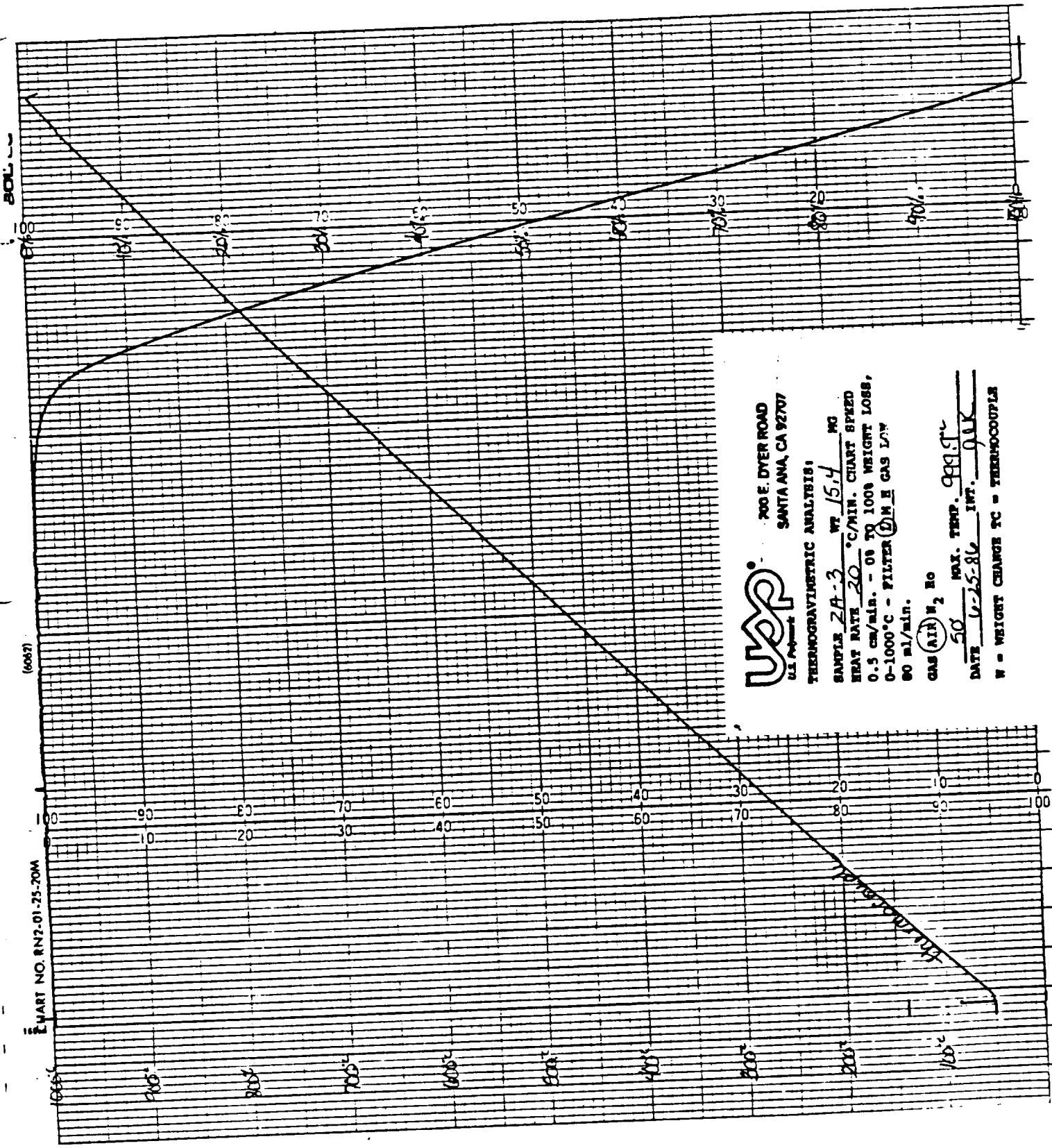




HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-24-86
#1 SAMPLE NASA LOT#2A-1
SOLVENT ETHYL GLYCOL
C=0.01 mg/ml

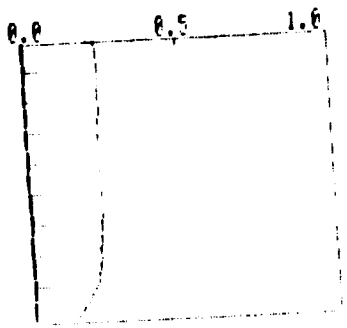
* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (PM)
D(MIN)	0.01(PM)
D(DIV)	0.50(PM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

TIME ABSORBANCE

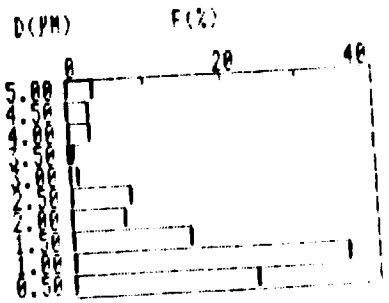


* DISTRIBUTION TABLE (BY VOL.)

D(PM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	3.3	3.3
4.50-4.00	2.6	5.9
4.00-3.50	2.7	8.7
3.50-3.00	0.5	9.2
3.00-2.50	0.9	10.0
2.50-2.00	7.8	17.8
2.00-1.50	7.0	24.7
1.50-1.00	15.2	39.9
1.00-0.50	36.1	76.0
0.50-0.00	24.0	100.0

D(AVE) 0.86 (PM)

* DISTRIBUTION GRAPH (BY VOL.)



LOT#2A-1
Sample #1

HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-24-86
#2 SAMPLE NASA LOT#2A-1
SOLVENT ETHYL GLYCOL
C=0.01 mg/ml

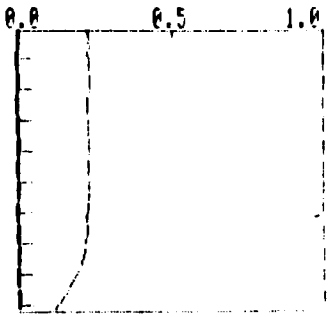
* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (PM)
D(MIN)	0.01(PM)
D(DIV)	0.50(PM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

TIME ABSORBANCE

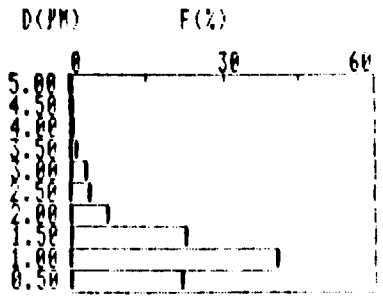


* DISTRIBUTION TABLE (BY VOL.)

D(PM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	0.0	0.0
4.50-4.00	0.0	0.0
4.00-3.50	0.0	0.0
3.50-3.00	1.1	1.1
3.00-2.50	3.0	4.1
2.50-2.00	3.8	7.8
2.00-1.50	7.4	15.2
1.50-1.00	22.4	37.6
1.00-0.50	40.8	78.3
0.50-0.00	21.7	100.0

D(AVE) 0.85 (PM)

* DISTRIBUTION GRAPH (BY VOL.)



LOT#2A-1
Sample#2

CHART 7A

HORIBA CAPA-500
PARTICLE ANALYZER

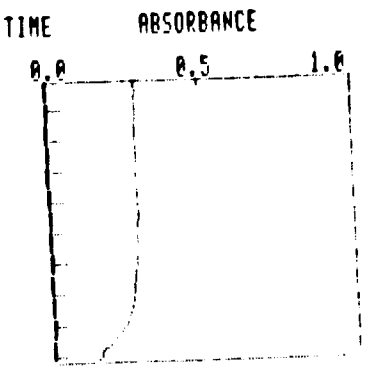
DATE 5-24-86
#1 SAMPLE NASA LOT#2A-2
SOLVENT ETHYL GLYCOL
C=0.01 mg/ml

* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (μM)
D(MIN)	0.01(μM)
D(DIV)	0.50(μM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

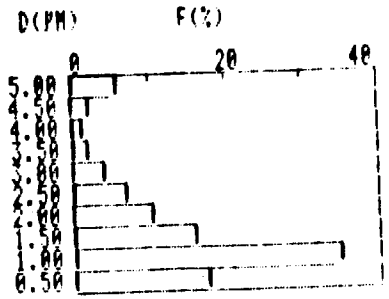


* DISTRIBUTION TABLE (BY VOL.)

D(μM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	5.7	5.7
4.50-4.00	2.2	7.9
4.00-3.50	1.2	9.1
3.50-3.00	1.7	10.8
3.00-2.50	4.0	14.8
2.50-2.00	6.7	21.5
2.00-1.50	10.2	31.7
1.50-1.00	16.0	47.7
1.00-0.50	34.8	82.5
0.50-0.00	17.5	100.0

D(AVE) 0.97 (μM)

* DISTRIBUTION GRAPH (BY VOL.)



Lot#2A-2
Sample#1

HORIBA CAPA-500
PARTICLE ANALYZER

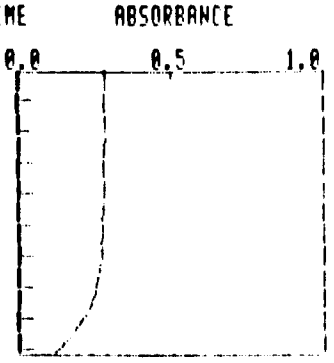
DATE 5-24-86
#2 SAMPLE NASA LOT#2A-2
SOLVENT ETHYL GLYCOL
C=0.01 mg/ml

* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (μM)
D(MIN)	0.01(μM)
D(DIV)	0.50(μM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

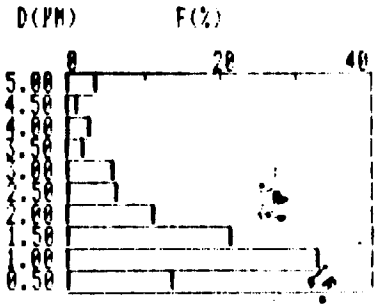


* DISTRIBUTION TABLE (BY VOL.)

D(μM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	3.5	3.5
4.50-4.00	1.0	4.5
4.00-3.50	2.8	7.3
3.50-3.00	2.0	9.3
3.00-2.50	5.7	14.9
2.50-2.00	6.1	21.0
2.00-1.50	11.2	32.2
1.50-1.00	21.2	53.5
1.00-0.50	33.0	86.4
0.50-0.00	13.6	100.0

D(AVE) 1.08 (μM)

* DISTRIBUTION GRAPH (BY VOL.)



Lot#2A-2
Sample#2

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CHART 7B

HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-24-86
#1 SAMPLE NASA LOT#2A-3
SOLVENT ETHYL GLYCOL
C=0.01 mg/ml

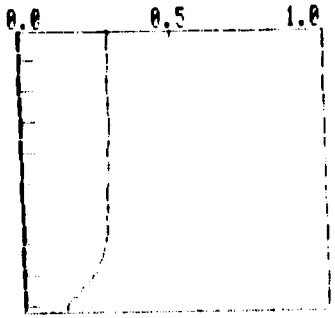
* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (PM)
D(MIN)	0.01(PM)
D(DIV)	0.50(PM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

TIME ABSORBANCE

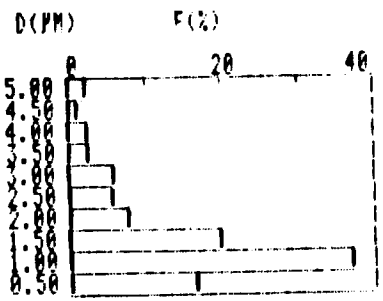


* DISTRIBUTION TABLE (BY VOL.)

D(PM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	2.0	2.0
4.50-4.00	0.9	2.9
4.00-3.50	2.3	5.2
3.50-3.00	2.2	7.5
3.00-2.50	5.7	13.2
2.50-2.00	5.6	18.8
2.00-1.50	7.5	26.3
1.50-1.00	19.9	46.2
1.00-0.50	37.2	83.4
0.50-0.00	16.6	100.0

D(AVE) 0.95 (PM)

* DISTRIBUTION GRAPH (BY VOL.)



Lot#2A-3
Sample #1

HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-24-86
#2 SAMPLE NASA LOT#2A-3
SOLVENT ETHYL GLYCOL
C=0.01 mg/ml

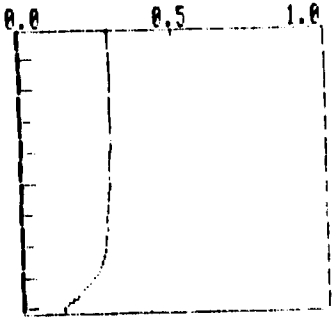
* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (PM)
D(MIN)	0.01(PM)
D(DIV)	0.50(PM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

TIME ABSORBANCE

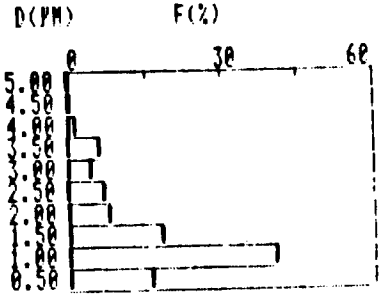


* DISTRIBUTION TABLE (BY VOL.)

D(PM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	0.0	0.0
4.50-4.00	0.0	0.0
4.00-3.50	1.1	1.1
3.50-3.00	5.8	6.9
3.00-2.50	4.1	11.1
2.50-2.00	6.9	18.0
2.00-1.50	7.7	25.7
1.50-1.00	17.8	43.4
1.00-0.50	40.7	84.1
0.50-0.00	15.9	100.0

D(AVE) 0.92 (PM)

* DISTRIBUTION GRAPH (BY VOL.)



Lot#2A-3
Sample#2

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CHART 7C

TABLE OF CONTENTS

RESIN TESTING

NAS8-36298

U.S. Polymeric O.E. 71108

91LD Resin Lot for NASA Lot# 2

CHARTS

U.S. Polymeric

RESIN TESTING

NAS8-36298

U.S. Polymeric O.E. 71108

91LD Resin Lot for NASA Lot# 2

	#2-1	#2-2	#2-3
1. Resin Solids, % PTM-7C	70.8	70.4	71.7
	70.8	70.2	71.2
	71.9	72.0	70.5
AVG.	71.2	70.9	71.1
Lot# 2 AVERAGE			71.1
2. Specific Gravity @ 25°C PTM-29C	1.141	1.140	1.139
Lot# 2 AVERAGE			1.140
3. Viscosity, Brookfield, cps. @ 22.8°C PTM-14C	1250	1250	1500
Lot# 2 AVERAGE			1333
4. Gel Time, min:sec PTM-47B	3:30	3:38	3:34
Lot# 2 AVERAGE			3:34

5. Atomic Absorption, ppm CTM-53B

	#2-1	#2-2	#2-3	LOT1 AVG
Na	4	4	8	5.3
K	0	0	0	0.0
Ca	3	2	2	2.3
Mg	1	1	1	1.0
Li	0	1	0	0.3
AVG.	8	8	11	9.0

6. Volatiles, Gas Chromatography CTM-55

See Charts 6A-6C

	#2-1	#2-2	#2-3
7. TGA, % Weight Loss at 500°C CTM-51 (AIR)	39.5	40.1	39.4
Lot# 2 AVERAGE			39.7

See Chart 7A-7C

8. DSC, temperature °C CTM-50A	183	191	183
Lot# 2 AVERAGE			186

See Chart 8A-8C

See Chart 9A-9C

9. HPLC CTM-49A

10. GPC, Average molecular wt. CTM-49A	1718	1801	1598
Lot# 2 AVERAGE			1706

See Chart 10A-10C

HITCO MATERIALS DIVISION
700 E. DYER ROAD, SANTA ANA, CALIFORNIA 92707 • (714) 549-1101 • TWX (910) 595-1130 • FAX # (714) 549-2858-5-2437

91LD Resin Lot for NASA Lot# 2

		#2-1	#2-2	#2-3
11. pH, units CTM-1B		8.5	8.3	8.4
			Lot# 2 AVERAGE	8.4
12. Phenol Content, % CTM-55 Appendix 1		10.04	11.09	11.74
		9.83	10.80	11.88
	AVG.	9.94	10.94	11.81
			Lot# 2 AVERAGE	10.90
13. Chang's Index, ml. CTM-5B		24.2	24.8	25.2
			Lot# 2 AVERAGE	24.7

14. RDS, Minimum Viscosity, cps. CTM-57A	Min. Visc.	°C
#2-1	278	107
#2-2	249	111
#2-3	239	113
AVG.	255	110

See Charts 14A-14C

See Charts 15A-15C

15. NMR
Vendor procedure

U. S. Polymeric

Hamid M. Quraishi

Hamid M. Quraishi, Manager
Quality Assurance Department

TYPICAL GAS CHROMATOGRAPH SET-UP

Operator Q.R.J.
Column
Length 6ft.
Dia. 1/4 in.
Liquid Phase OV-1000
Wt. % 0.1
Support GRAPHPAC
Mesh 80/100
Carrier Gas He
Rotameter
Inlet Press 60 psig
Rate 30 ml/min
CHART SPEED
SAMPLE 9/LD,12-1
Size 0.1 µl

Date 12/10/86
Detector FID
Voltage
Sensit.
Flow Rates, ml/min
Hydrogen 60 Air 36
Scavenge
Split
Temperature, °C
Det. 220 Inj. 200
Column Initial 60
Final 210
Rate 5°C/MIN
Solvent THF
Concn. 0.10781 g/ml

GAS CHROMATOGRAPHY STANDARD SOLVENT

TEST METHOD CTM-55

STANDARD SOLVENT/MONOMER	RETENTION TIME (MINS.)
MEOH	.6
ETHANOL	1.18
MECL2	1.28
ACETONE	1.45
IPA	1.83
THF	3.08
ACETONITRILE	3.2
CRESOL	4.03
MEK	4.08
FURFURAL	15.03
TOLUENE	17.98
CHLOROBENZENE	19.6
PHENOL	22.08

NOTE: THF WAS USED TO DILUTE THE RESIN SAMPLES.

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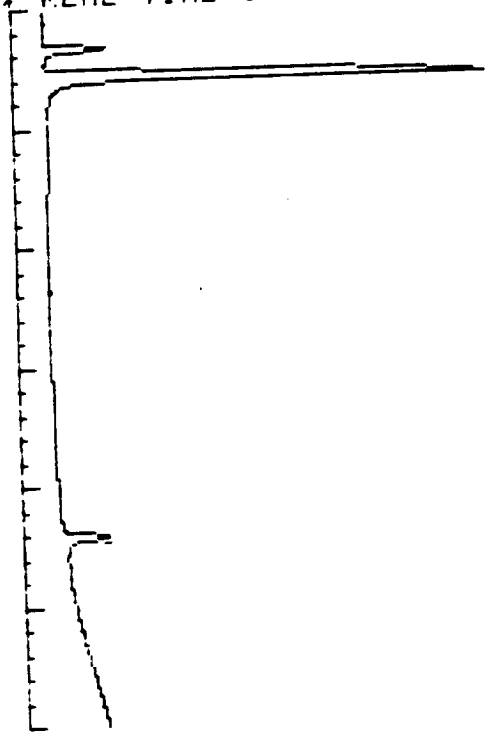
CHART 6A

*** REAL TIME CHROMATOGRAM ***



INAL FULL SCALE MV =1000.00

SAMPLE: 91 LD 2-1
MISC.: C=0.101781 GMS/ML

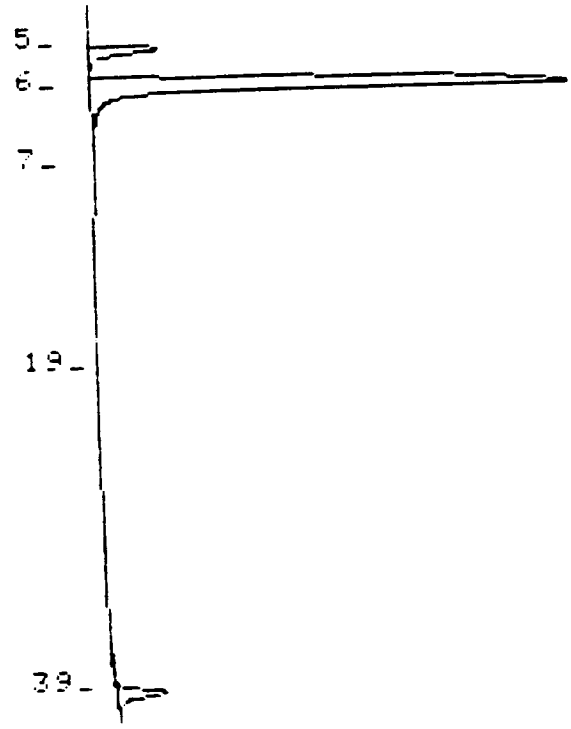
TIME: 11:49
DATE: 12/10/86
OPERATOR: JG2

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
2	.65	1789	.075	2	235
5	1.70	204140	8.568	2	11953
6	3.05	2010900	84.397	3	84306
7	5.55	1537	.065	4	127
19	11.90	2214	.093	2	96
39	22.05	162080	6.802	1	8700

TOTAL AREA= 2382661
THRESHOLD= 1
MIN PK WIDTH= 15
AREA REJECT= 1000

VERTICAL SCALE FACTOR 1?



SAMPLE: 91 LD 2-1
MISC.: C=0.101781 GMS/ML

TIME: 11:49
DATE: 12/10/86
OPERATOR: JG2

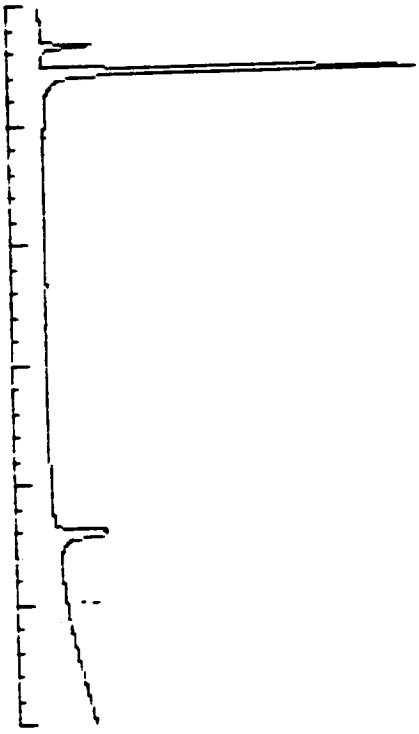
RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
5	1.70	204140	8.588	2	11953
6	3.05	2010900	84.594	3	84306
39	22.05	162080	6.818	1	8700

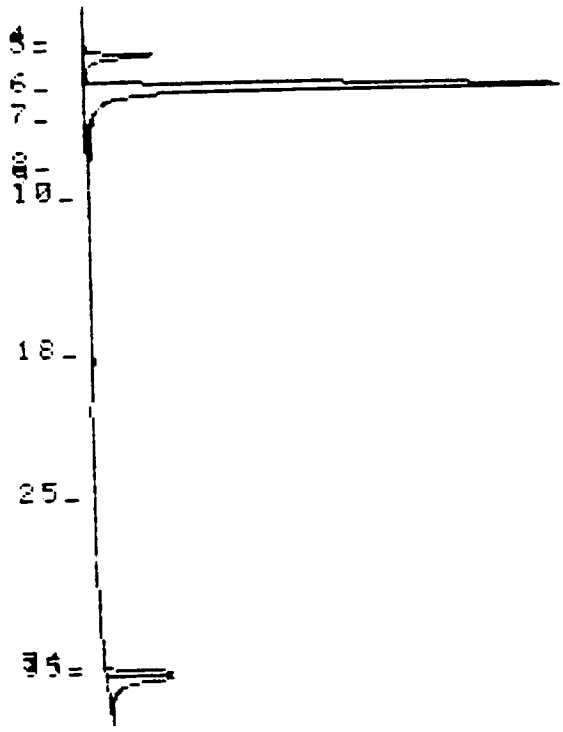
TOTAL AREA= 2377120
THRESHOLD= 1
MIN PK WIDTH= 15
AREA REJECT= 2300

CHART 6B

*** REAL TIME CHROMATOGRAM ***



VERTICAL SCALE FACTOR: 1%



FINAL FULL SCALE MV.=1000 00

SAMPLE: 91 LD 2-2
MISC: C=0.10137 GMS/ML

TIME: 16:17
DATE: 12/10/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
2	.68	1634	.095	3	146
4	1.43	1854	.108	2	207
5	1.70	135890	7.939	2	10181
6	2.93	1192800	69.685	3	72100
7	3.95	41333	2.415	4	585
8	5.55	5852	.342	4	354
9	6.03	9425	.551	4	249
10	6.58	9398	.549	4	189
18	11.75	10601	.619	1	547
25	16.45	1194	.070	2	39
34	21.98	104460	6.103	2	10015
35	22.15	197270	11.525	3	9916

TOTAL AREA= 1711710
THRESHOLD= 1
MIN PK WIDTH= 15
AREA REJECT= 1000

SAMPLE: 91 LD 2-2
MISC: C=0.10137 GMS/ML

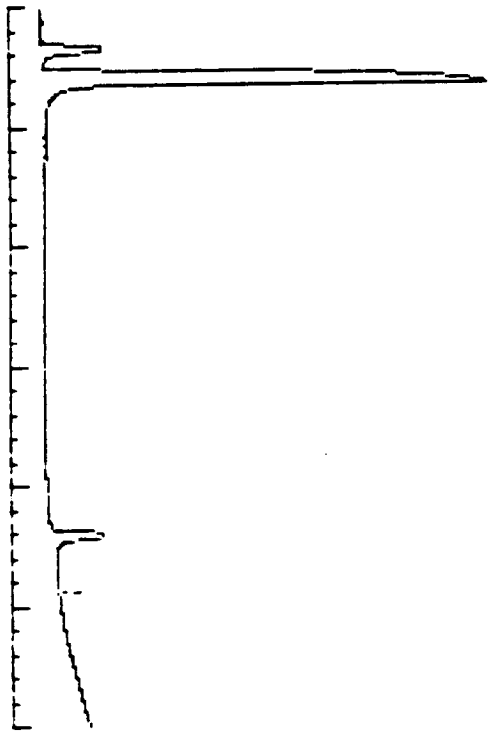
TIME: 16:17
DATE: 12/10/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
5	1.70	135890	8.129	2	10181
6	2.92	1192800	71.350	3	72100
7	3.95	41333	2.472	4	585
34	21.98	104460	6.249	2	10015
35	22.15	197270	11.800	3	9916

TOTAL AREA= 1671753
THRESHOLD= 1
MIN PK WIDTH= 15
AREA REJECT= 11000

*** REAL TIME CHROMATOGRAM ***



FINAL FULL SCALE MV =1000.00

SAMPLE: 91 LD 2-3
MISC.: C=0.10126 GMS/ML

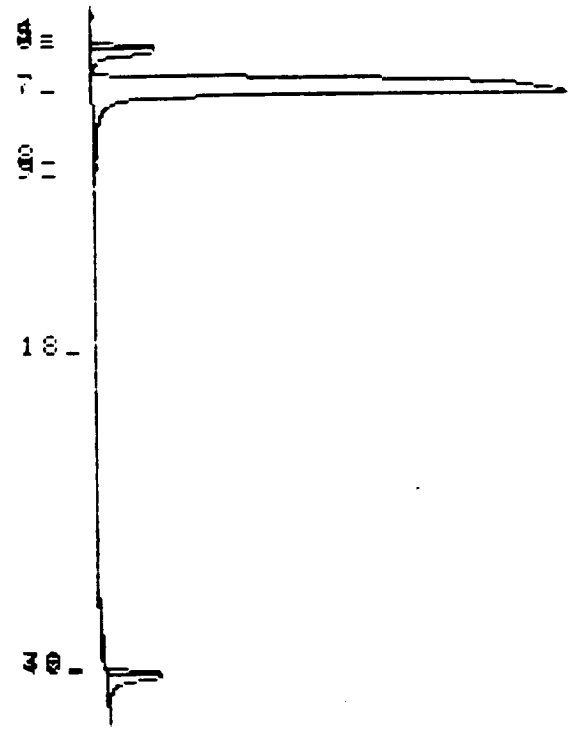
TIME: 16:58
DATE: 12/10/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
2	.63	4204	.123	3	435
4	1.45	1258	.037	2	129
5	1.68	81270	2.382	2	11465
6	1.83	196320	5.753	2	11447
7	3.28	2899700	84.980	3	85372
8	5.60	2293	.067	4	251
9	6.03	1464	.043	4	69
18	11.83	6140	.180	3	248
39	22.03	54263	1.590	2	9873
40	22.15	165300	4.844	3	9807

TOTAL AREA= 3413211
THRESHOLD= 1
MIN PK WIDTH= 15
AREA REJECT= 1000

VERTICAL SCALE FACTOR: 1X



SAMPLE: 91 LD 2-3
MISC.: C=0.10126 GMS/ML

TIME: 16:58
DATE: 12/10/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
5	1.68	81270	2.393	2	11465
6	1.83	196320	5.779	2	11447
7	3.28	2899700	85.364	3	85372
39	22.03	54263	1.597	2	9873
40	22.15	165300	4.866	3	9807

TOTAL AREA= 3396853
THRESHOLD= 1
MIN PK WIDTH= 15
AREA REJECT= 6200

Sample: 91-LD 71108/2-1
Size: 24.898 mg
Run No: MIR #13103 (I2)
Date: MAY/27/86 07:17

TGA

OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Operator: M. WEGENER
Disk ID: DATA DISK #108
File No: D 3.DAT V2.1
Plotted: MAY/28/86 07:27

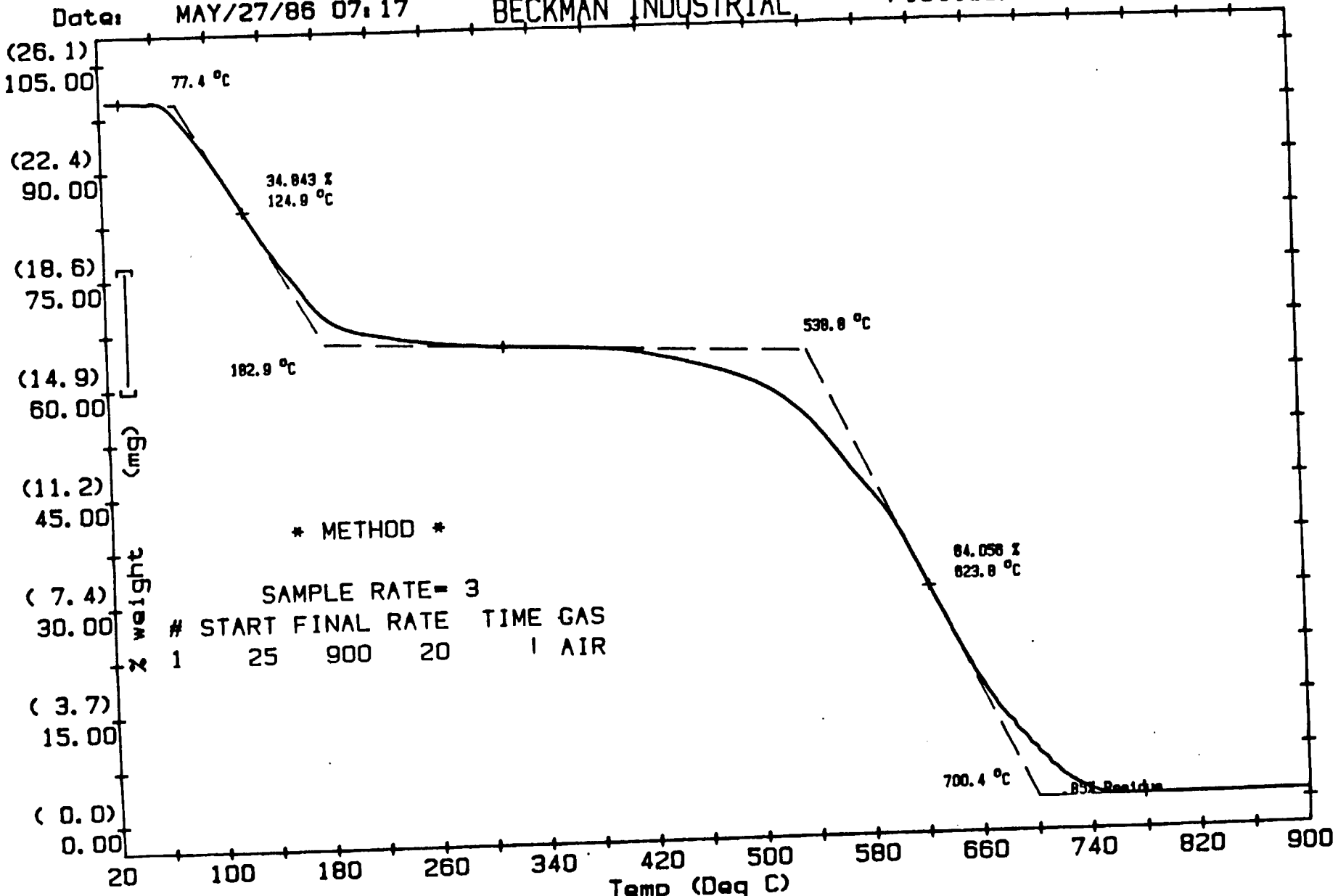


CHART 7A

Beckman Industrial™, ANALYTICAL LABORATORY SERVICES

Sample: 91-LD 71108/2-2
Size: 16.807 mg
Run No: MIR #13103 (I2)
Date: MAY/27/86 08:57

TGA

OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Operator: M. WEGENER
Disk ID: DATA DISK #108
File No: D 4.DAT V2.1
Plotted: MAY/28/86 07:39

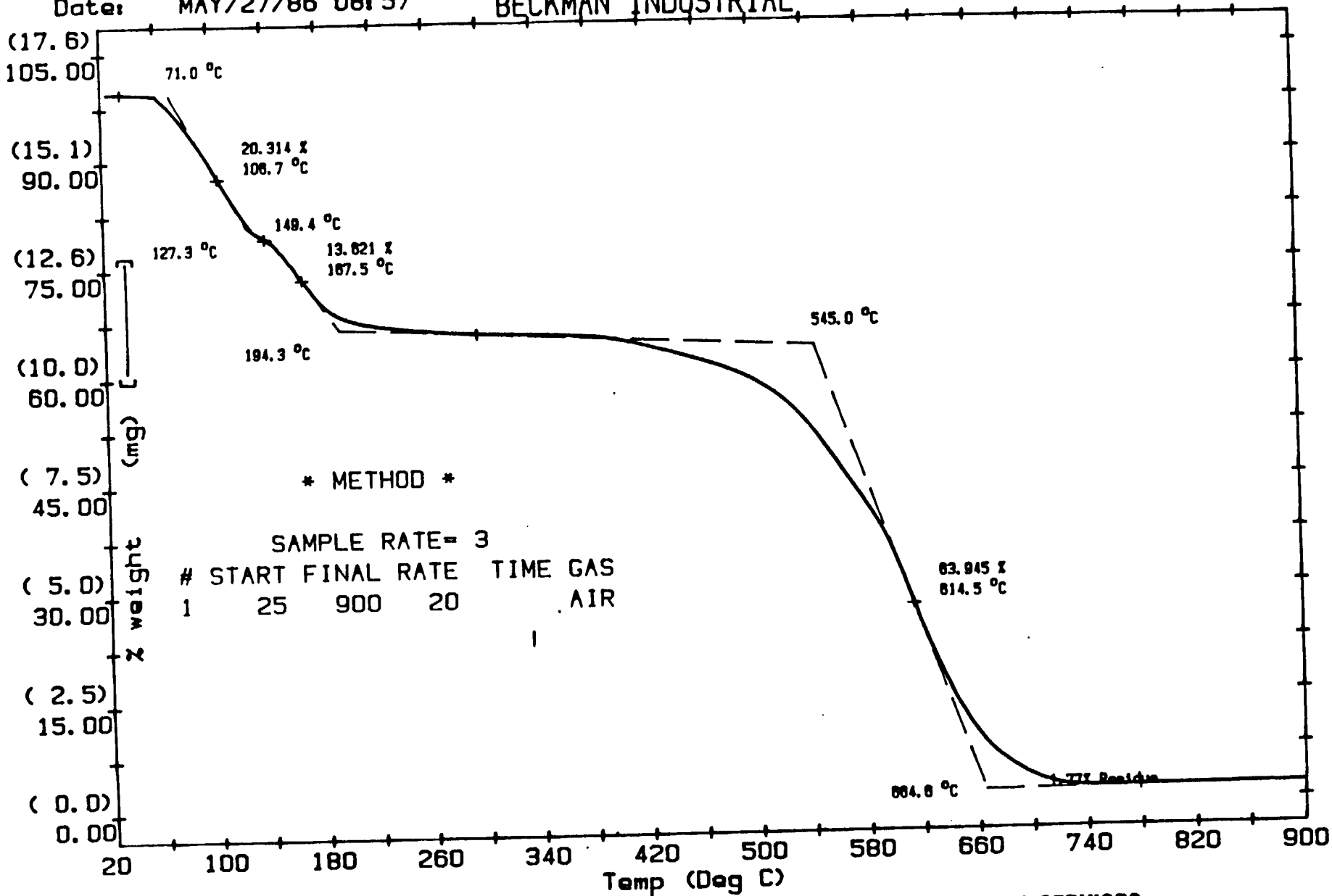


CHART 7B

Beckman Industrial™ ANALYTICAL LABORATORY SERVICES

Sample: 91-LD 71108/2-3
Size: 14.963 mg
Run No: MIR #13103 (I2)
Date: MAY/27/86 10:57

TGA

OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Operator: M. WEGENER
Disk ID: DATA DISK #108
File No: D 5.DAT V2.1
Plotted: MAY/28/86 07:56

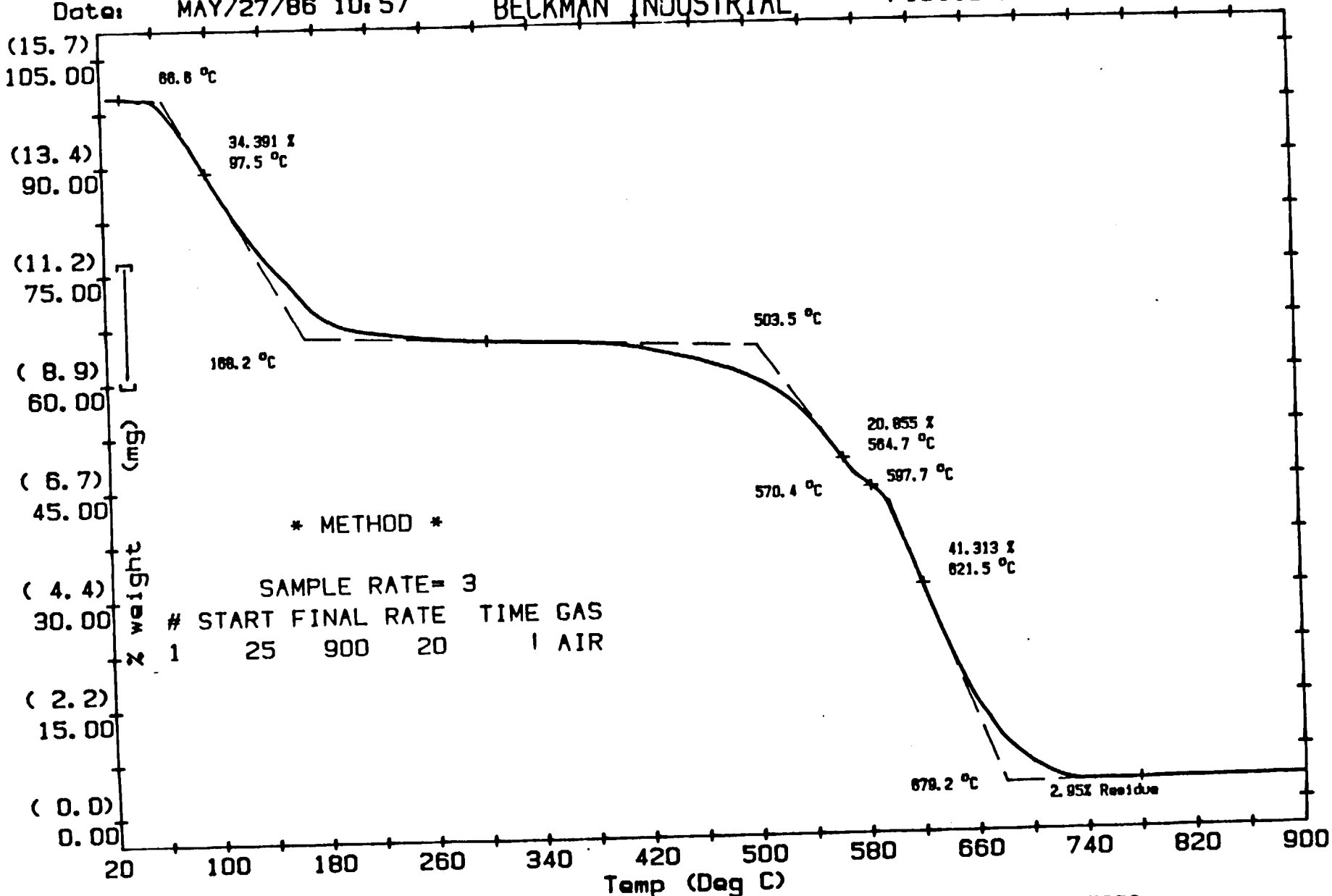


CHART 7C

Beckman Industrial™ ANALYTICAL LABORATORY SERVICES

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CHART 8A

U.S. POLYMERIC DSC-2

Sample 9-LD 2-1 Wt Y.K. mg
Heat Rate 20 °C/min. Range 2.0 mcals/sec
Recorder Span: 50 mV Chart speed 10 mm/min
Temp. Limits: Lower 50 ° Upper 350 °
Mode: Hold/Autocool/Cycle Cooling Rate 10 °C/min
Operator A. Katdel Date 9-5-86

9-2-86 LAST CALIBRATION DATE
-1° CALIBRATION DELTA °C

EXOTHERM

184

185.12

(2909)

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CHART 8B

U.S. POLYMERIC DSC-1

Sample: N-45 2-2 Wt: 5.0 mg
Heat Rate: 20 °C/min Range: 2.5 mcal/sec
Recorder Span: 50 mV Chart speed: 10 mm/min
Temp Limits Lower: 50 °C Upper: 350 °C
Mode: Hold/Autotool/Cycle Cooling Rate: 80 °C/min
Operator: A. Kattley Date: 2-5-86

2-2-86 LAST CALIBRATION DATE
+11° CALIBRATION DELTA °C

EXOTHERM

192
191 °C

CHART NO. RN2-0525-20M (6067)

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CHART 8C

U.S. POLYMERIC DSC-2

Sample 9110 2.3 Wt. 11.2 mK
Heat Rate 20 °C/min. Range 2.5 mcals/sec.
Recorder Span: 50 mV Chart speed 10 mm/min
Temp. Limits: Lower 50 ° Upper 250 °
Mode: Manual/Autocool/Cycle Cooling Rate 40 °C/min
Operator A. Kaelin Date 9-5-86

9-2-86 LAST CALIBRATION DATE
-1 CALIBRATION DELTA °C

EXOTHERM

184°
183°C

CHART NO. RN2-01-25-20M

SOLTEC

CHART 9A

FILE A:PHEN039.HDR TAKEN 09-05-1986 16:56:50

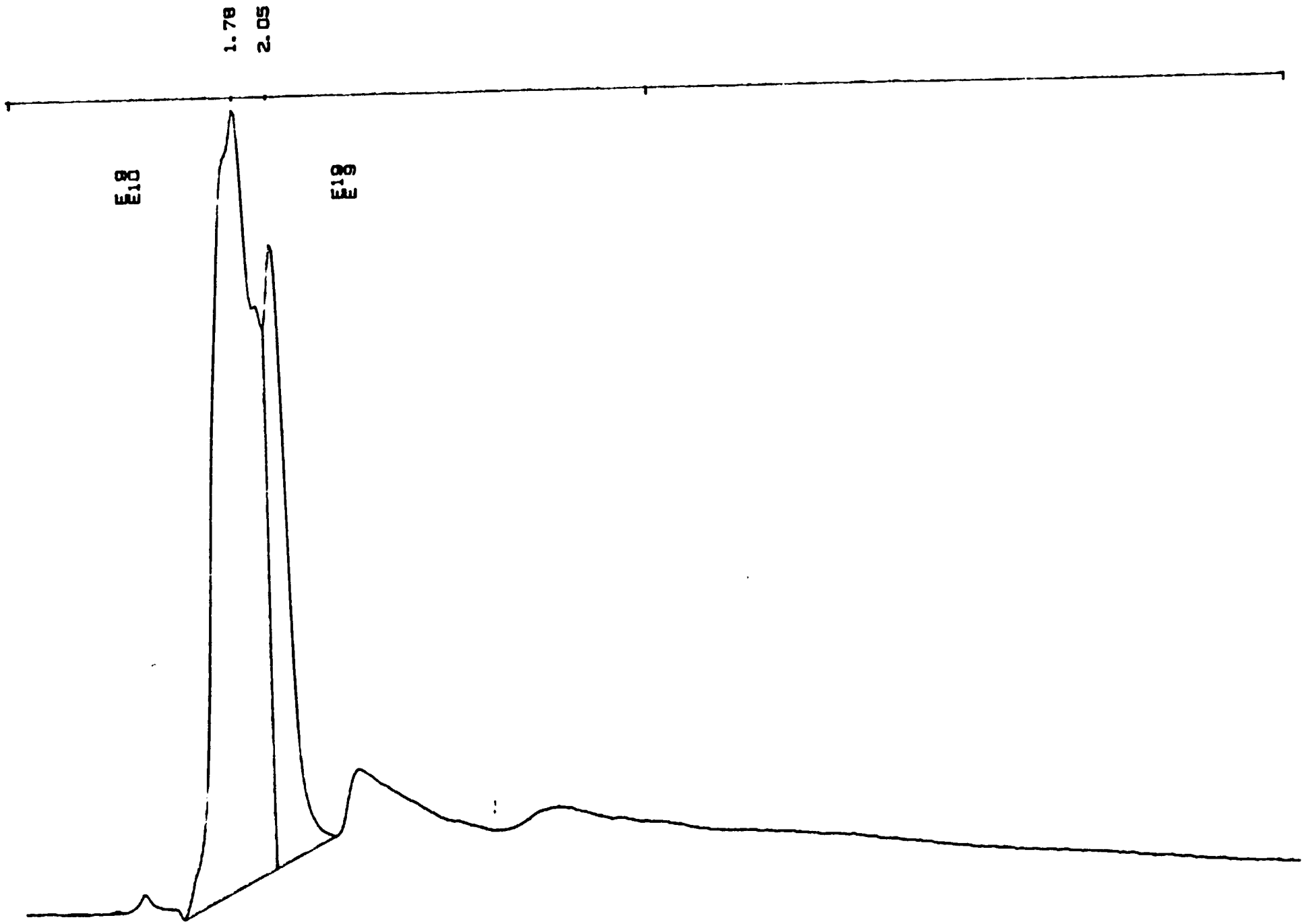
******** AREA PERCENT REPORT ********

Sample Name: 91LD,2-1,C=6.85 Operator Initials: JGZ
Date: 09-05-1986 16:56:50 Method:PHENOLIC DATA FILE: A:PHEN039.PTS
Interface: 4 Cycle#: 39 Channel#: 0 Vial#: N.A.
Starting Peak Width: 10 Threshold: .01
Instrument Type: BECKMAN HPLC Column Type: MICROBONDAPAK C-18
Solvent Description: THF/WATER, 2:1 BY WEIGHT
Operating Conditions: R.T., FLOWRATE=1.5 ML/MIN
Detector 0: 220NM/.5AU Detector 1:
Misc. Information: LENGTH=25
Starting Delay: 0.00 Ending Retention Time: 10.00

Pk No.	Ret Time	Peak Area	Area %	B L	Peak Ht.	Normalized %	Area/ Height
3	1.78	120482	75.1672	2	5050	100.000	23.9
4	2.05	39804	24.8328	2	4045	33.037	9.8

Total Area: 160286 Area Reject: 1000 One sample per 1.000 sec.

DATA FILE=PHEN038 FROM 0.00 MIN. TO 10.00 MIN. LOW SCALE= 5.426 Mv. HIGH SCALE= 10.712 Mv.
81 LD. 2-1. C=6.85 MG/ML. 9/5/86. JGZ



FILE A:PHEN038.HDR TAKEN 09-05-1986 16:40:05

********* AREA PERCENT REPORT *********

```
**********************************************************************
* Sample Name: 91LD,2-2,C=6.77          Operator Initials: JGZ       *
* Date:  09-05-1986 16:40:05 Method:PHENOLIC  DATA FILE: A:PHEN038.PTS *
* nterface: 4                Cycle#:  38      Channel#: 0   Vial#: N.A. *
* Starting Peak Width:  10   Threshold:  .01                          *
**********************************************************************
*  Instrument Type: BECKMAN HPLC          Column Type: MICROBONDAPAK C-18 *
*              Solvent Description: THF/WATER, 2:1 BY WEIGHT           *
*   Operating Conditions: R.T., FLOWRATE=1.5 ML/MIN                    *
*            Detector 0: 220NM/.5AU          Detector 1:               *
*     Misc. Information:  LENGTH=25                                    *
**********************************************************************
Starting Delay:   0.00                    Ending Retention Time:   10.00
```

Pk No.	Ret Time	Peak Area	Area %	B L	Peak Ht.	Normalized %	Area/ Height
3	1.78	121012	74.9964	2	5109	100.000	23.7
4	2.05	40345	25.0036	2	4092	33.340	9.9

```
Total Area:      161357   Area Reject:      1000  One sample per   1.000 sec.
```

DATA FILE=PHEN038 FROM 0.00 MIN. TO 10.00 MIN. LOW SCALE= 5.320 Mv. HIGH SCALE= 10.656 Mv.
91 LD. 2-2, C=6.77 MG/ML. 8/5/86. JGZ

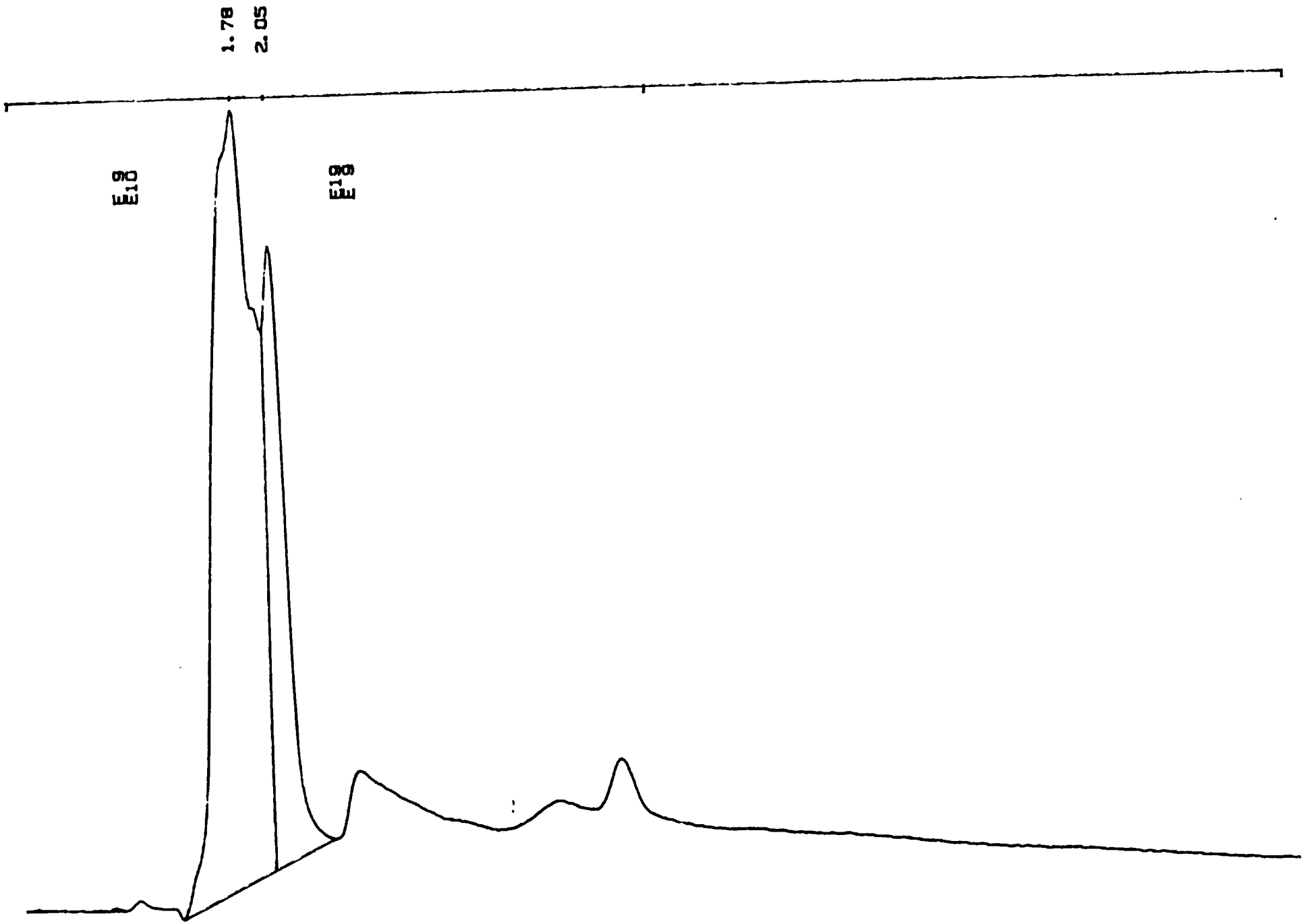


CHART 9C

ror 67 opening raw data file A:LASTRUN.PTS
r or 53 creating file A:PHEN040.PTS at line 4620
FILE A:PHEN037.HDR TAKEN 09-05-1986 16:04:07

******** AREA PERCENT REPORT ********

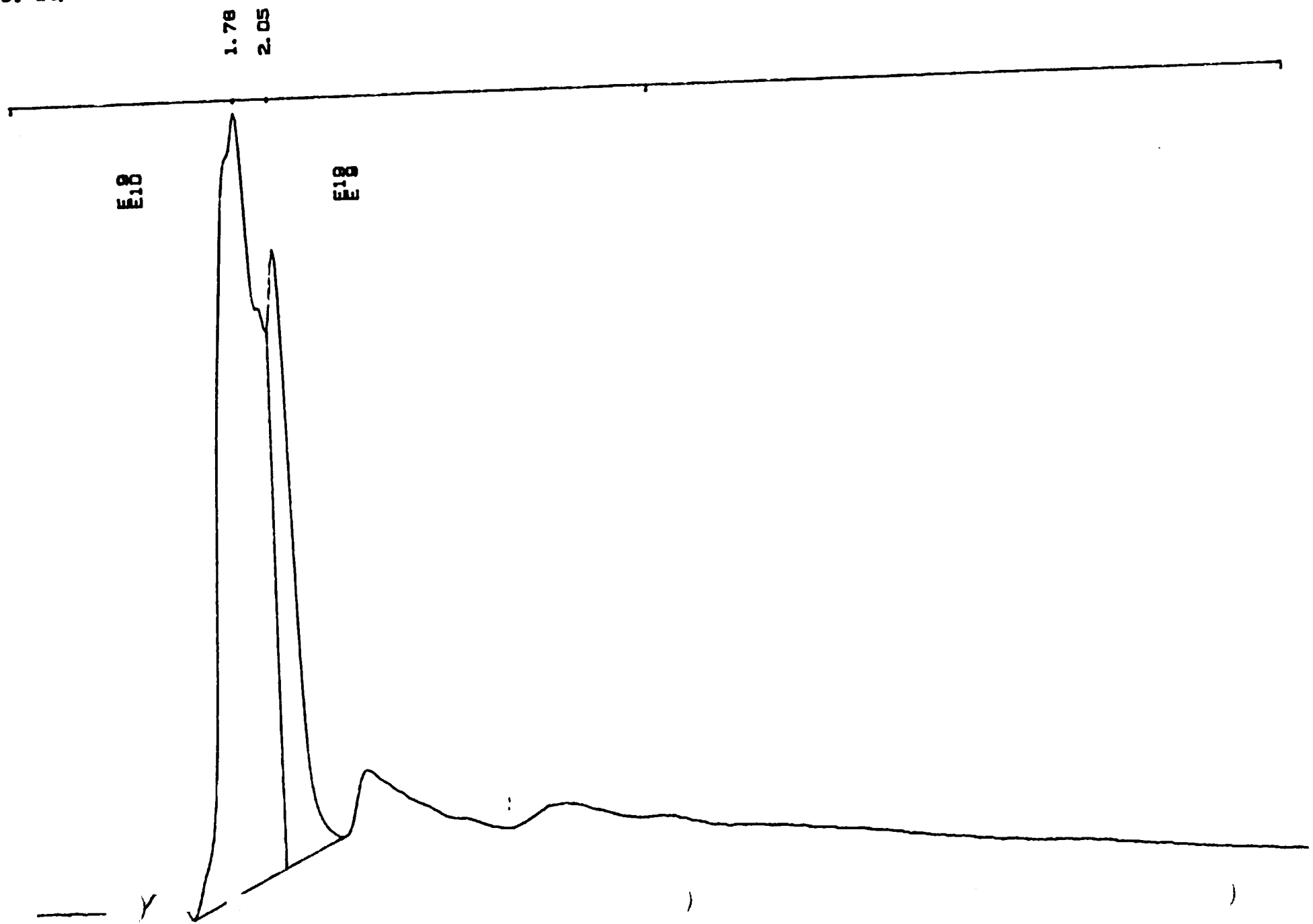
Sample Name: 91LD,2-3,C=6.79 Operator Initials: JGZ
Date: 09-05-1986 16:04:07 Method:PHENOLIC DATA FILE: A:PHEN037.PTS
Interface: 4 Cycle#: 37 Channel#: 0 Vial#: N.A.
Starting Peak Width: 10 Threshold: .01
Instrument Type: BECKMAN HPLC Column Type: MICROBONDAPAK C-18
Solvent Description: THF/WATER, 2:1 BY WEIGHT
Operating Conditions: R.T., FLOWRATE=1.5 ML/MIN
Detector 0: 220NM/.5AU Detector 1:
Misc. Information: LENGTH=25

Starting Delay: 0.00 Ending Retention Time: 10.00

Pk No	Ret Time	Peak Area	Area %	B L	Peak Ht.	Normalized %	Area/ Height
2	1.78	121706	75.2396	2	5098	100.000	23.9
3	2.05	40052	24.7604	2	4076	32.909	9.8

Total Area: 161758 Area Reject: 1000 One sample per 1.000 sec.

DATA FILE=PHEN037 FROM 0.00 MIN. TO 10.00 MIN. LOW SCALE= 5.424 Mv. HIGH SCALE= 10.752 Mv.
91 L), 2-3, C=6.78 MG/ML, 8/5/86, JGZ



*** Calibration Data ***
Calibration Name:
Misc Information:

Fit Type: 3
Log Mol Wt = A + Bx + Cx^2 + Dx^3
A= 2.538977 B= 2.115815 C= -.5646824 D= 3.606432E-02
Coefficient of Determination: 0.9902

Ret Time	Molecular Weight	Log Mol Wt
3.50	35000	4.544
4.33	15000	4.176
4.83	3600	3.556
5.09	2350	3.371
6.00	570	2.756
7.17	92	1.964
7.50	72	1.857

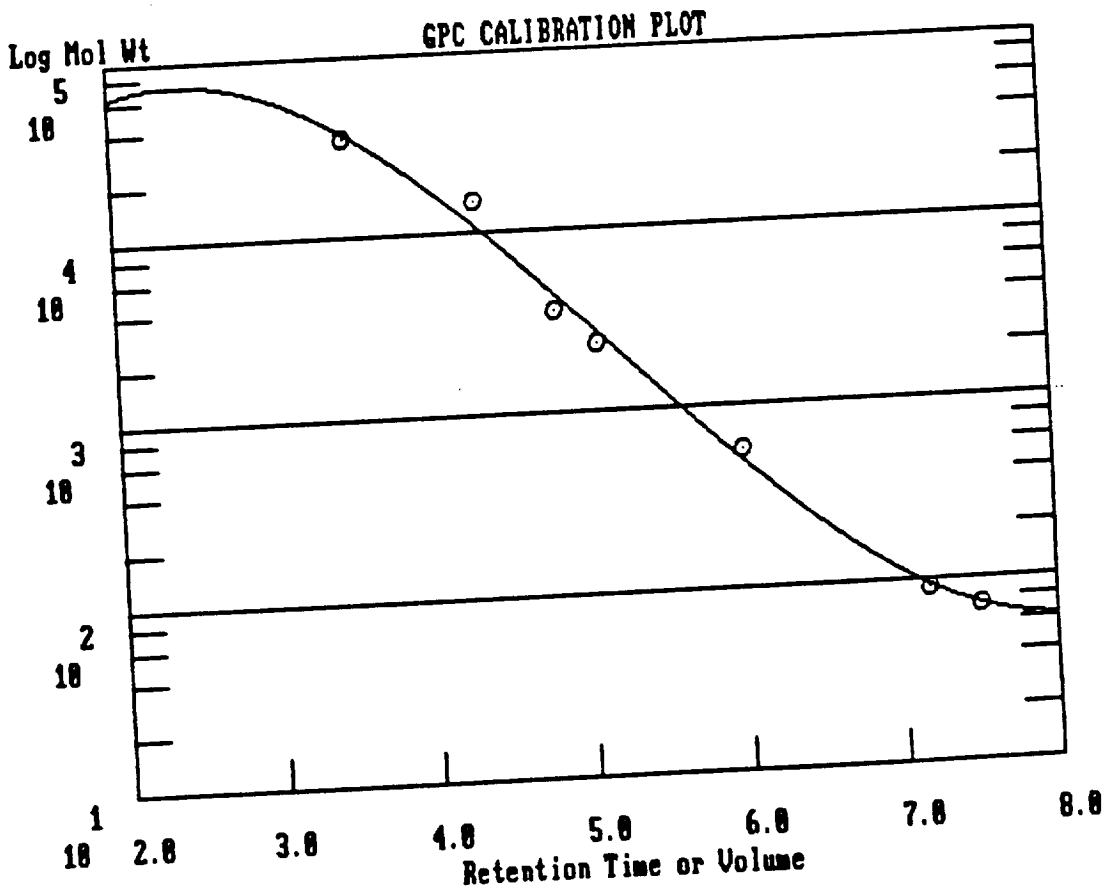


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CHART 10A

9 FILE B:GPC28 .HDR TAKEN 08-05-1986 17:13:56

******** GPC REPORT ********

```
**********************************************************************
* Sample Name: 91LD 2-1  =2.68          Operator Initials: GBF       *
* Date:  08-05-1986 14:05:42 Method:    DATA FILE: B:GPC28   .PTS     *
* Interface: 5               Cycle#:  28 Channel#: 0   Vial#: N.A.   *
* Starting Peak Width:  60   Threshold:  0                            *
**********************************************************************
*  Instrument Type: HPLC/BECKMAN          Column Type: ULTRASTYRAGEL 500A *
*            Solvent Description: THF                                *
*   Operating Conditions: T=35C FLOWRATE=2.0ML/MIN                   *
*           Detector 0: 254NM/.1AU          Detector 1:              *
*     Misc. Information: CALIBRATION/GPC                             *
**********************************************************************
Starting Delay:    0.00                 Ending Retention Time:   10.00
Calibration file: GPCPHEN
Molecular Weight Distribution Averages
Baseline TIMES:    3.85 to   10.00   MW:     22295 to          2
Process .TIMES:    3.85 to   10.00   MW:     22295 to          2
Total Area:       196902
Mw=                 1718
M =                  370
M /Mn=            4.6439
Mz=                 4134
                    1501
```

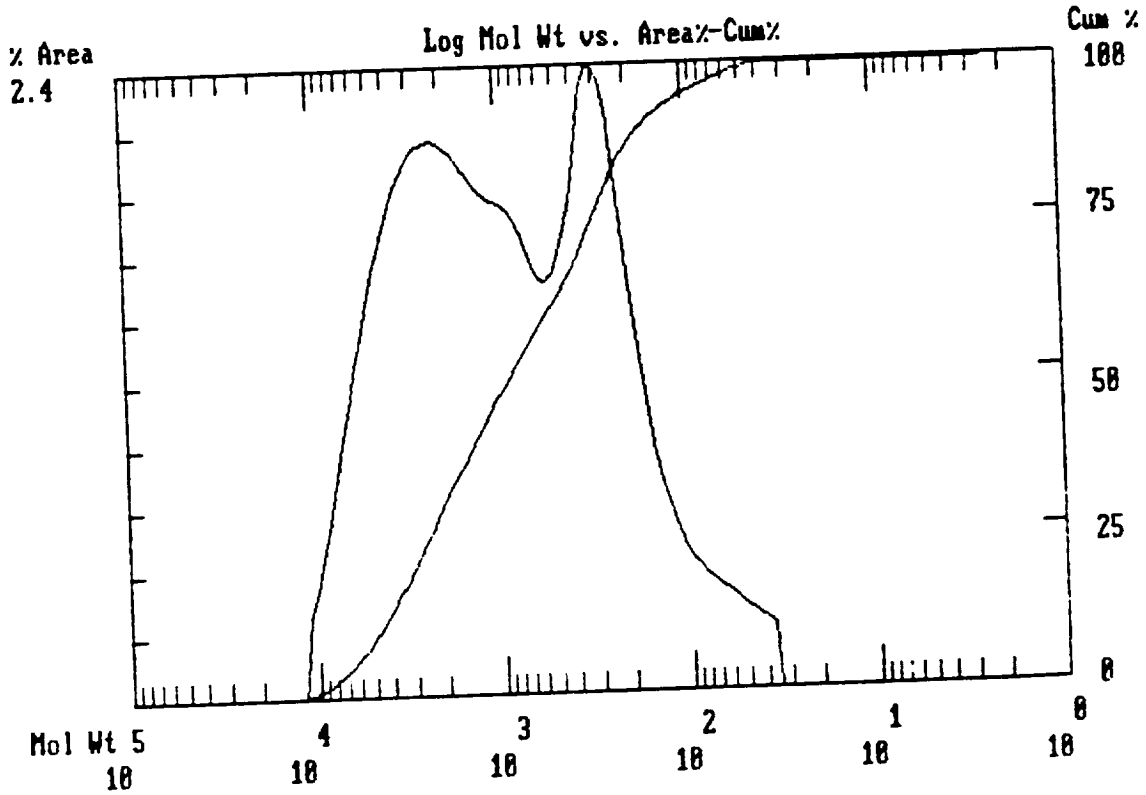
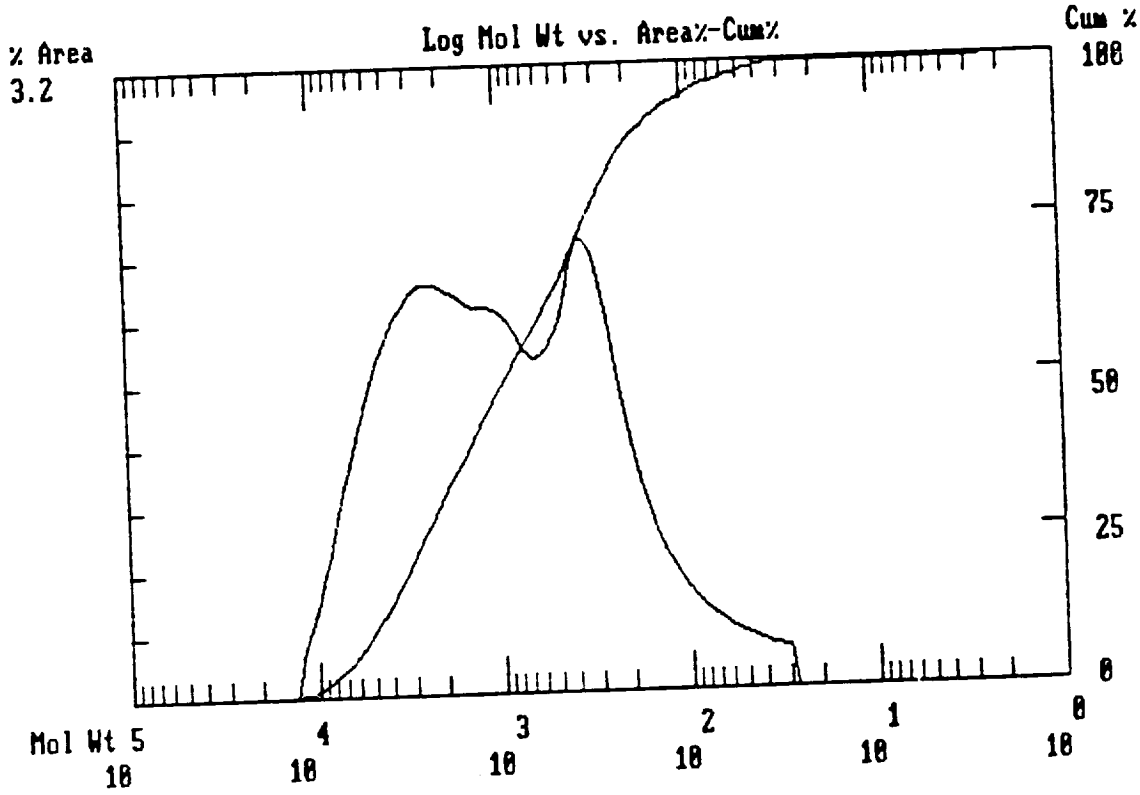


CHART 10B

A A FILE B:GPC22 .HDR TAKEN 08-05-1986 17:18:27

********* GPC REPORT *********

```
* **********************************************************************************
 Sample Name: 91LD 2-2 C=2.68                  Operator Initials: GBF          *
 Date: 08-05-1986 11:58:33 Method:             DATA FILE: B:GPC22   .PTS     *
  nterface: 5              Cycle#:  22         Channel#: 0    Vial#: N.A.     *
 Starting Peak Width:  60  Threshold:  0                                      *
**********************************************************************************
  Instrument Type: HPLC/BECKMAN          Column Type: ULTRASTYRAGEL 500A      *
              Solvent Description: THF                                        *
   Operating Conditions: T=35C FLOWRATE=2.0ML/MIN      Detector 1:           *
           Detector 0: 254NM/.1AU                                             *
     Misc. Information: CALIBRATION/GPC                                       *
**********************************************************************************
                                        Ending Retention Time:   10.00
Starting Delay:   0.00
Ca ibration file: GPCPHEN
Mo ecular Weight Distribution Averages
Baseline TIMES:    3.85 to   10.00   MW:    22295 to        2
Pr cess  TIMES:    3.85 to   10.00   MW:    22295 to        2
Tc al Area:       240471
Mw=                 1801
Mn=                  368
Mw Mn=            4.8945
Mz=                 4352
Mv=                 1573
```



******** GPC REPORT ********

```
**********************************************************************
* Sample Name: 91LD 2-3 C=2.68                Operator Initials: GBF *
* Date:  08-05-1986 11:28:37 Method:GPC       DATA FILE: A:GPC20.PTS *
* Interface: 5                Cycle#:  20     Channel#: 0   Vial#: N.A. *
* Starting Peak Width:  60    Threshold:  .01                        *
**********************************************************************
*  Instrument Type: HPLC/BECKMAN          Column Type: ULTRASTYRAGEL 500A *
*             Solvent Description: THF                                 *
*   Operating Conditions: T=35C FLOWRATE=2.0ML/MIN                     *
*           Detector 0: 254NM/.1AU          Detector 1:                *
*     Misc. Information: CALIBRATION/GPC                               *
**********************************************************************
Starting Delay:    0.00                  Ending Retention Time:   10.00
Calibration file: GPCPHEN
Molecular Weight Distribution Averages
Baseline TIMES:    3.85 to   10.00   MW:    22295 to          2
Process  TIMES:    3.85 to   10.00   MW:    22295 to          2
Total Area:       271362
Mw=                 1598
Mn=                  260
Mw/Mn=            6.1449
Mz=                 3922
Mv=                 1389
```

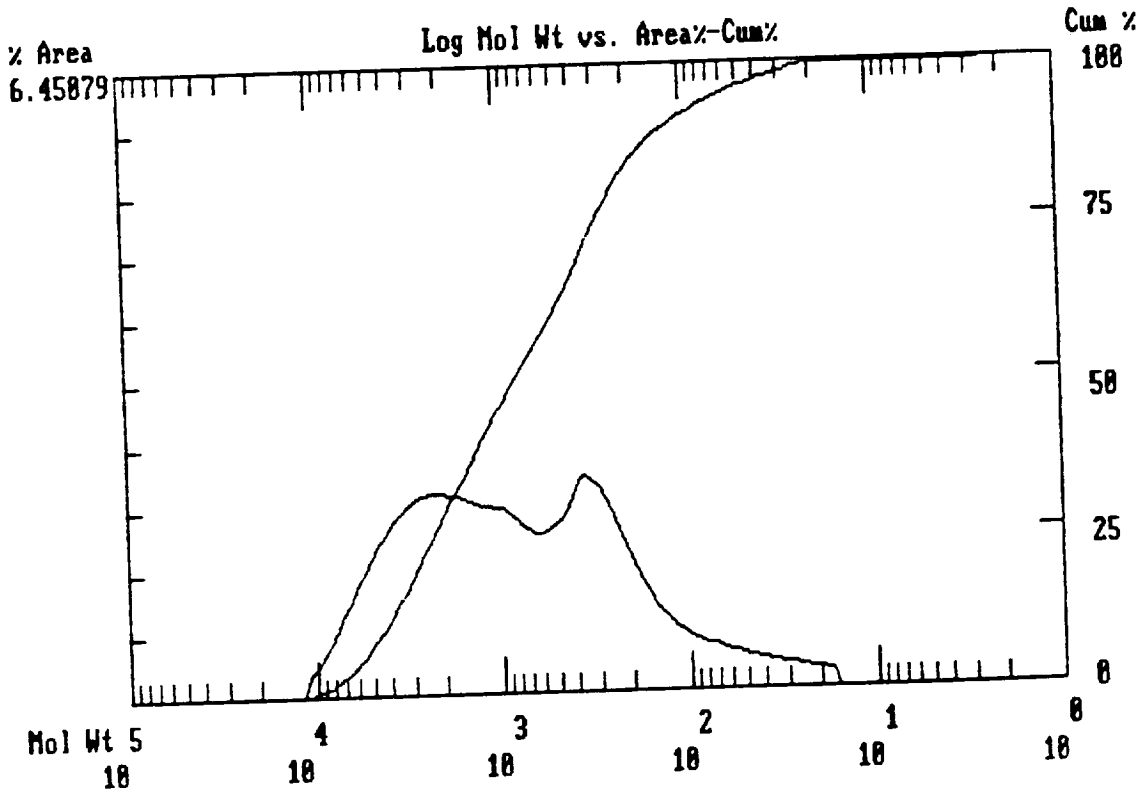
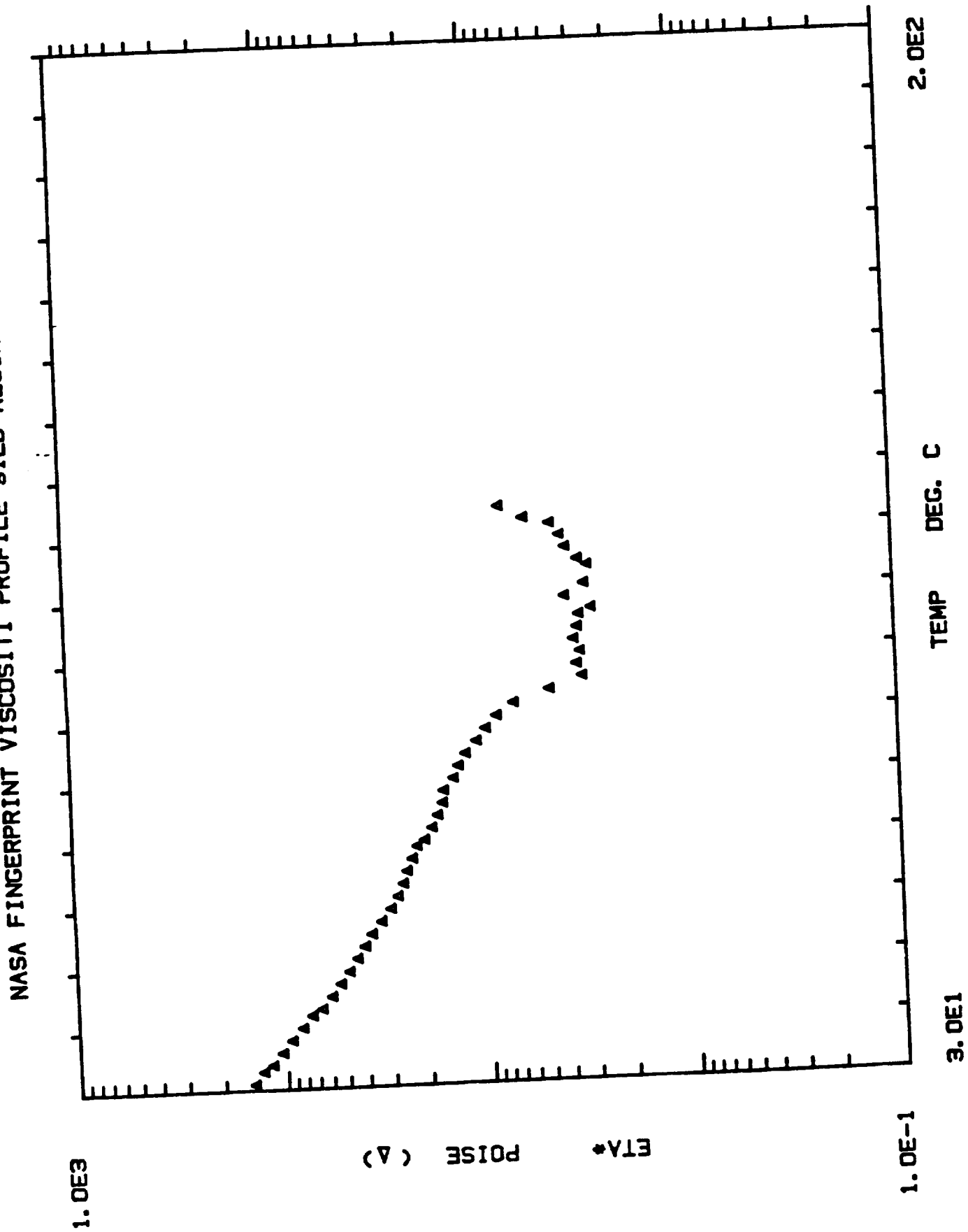


CHART 14A


NASA FINGERPRINT VISCOSITI PROFILE 91LD RESIN NASA LOT2-1
1.0E3
ETA* POISE (A)
1.0E-1
3.0E1
TEMP DEG. C
2.0E2

Rheometrics RECAP II

perirnent No. : 12 Sample No. : 1

FINGERPRINT VISCOSITI PROFILE 91LD RESIN NASA LOT2-1

e ator :CP

t and Time : Tuesday, August 19, 1986 — 13:19:16

erating Mode : DYNAMIC

e p Type : CURE

ometry : DISK & PLATE
RADIUS : 25.00
GAP : 0.50

t s :
RAIN =50%
REQUENCY =10RAD/SEC

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NASA FINGERPRINT VISCOSITI PROFILE 91LD RESIN NASA LOT2-1

NO.	ETA* POISE	ETA' POISE	ETA" POISE	TORQUE GRAMS-CM	TIME MIN.	TEMP DEG. C
1	1.414e+002	1.350e+002	4.203e+001	1.777e+001	2.000e-001	3.100e+001
2	1.414e+002	1.355e+002	4.051e+001	1.778e+001	1,000e+000	3.100e+001
3	1.278e+002	1.226e+002	3.592e+001	1.605e+001	2.000e+000	3.300e+001
4	1.151e+002	1.095e+002	3.557e+001	1.446e+001	3.000e+000	3.400e+001
5	1.031e+002	9.673e+001	3.559e+001	1.295e+001	4.000e+000	3.600e+001
6	9.226e+001	8.526e+001	3.525e+001	1.159e+001	5.000e+000	3.800e+001
7	8.141e+001	7.379e+001	3.440e+001	1.022e+001	6.000e+000	4.000e+001
8	7.292e+001	6.490e+001	3.325e+001	9.160e+000	7.000e+000	4.200e+001
9	6.498e+001	5.671e+001	3.171e+001	8.155e+000	8.000e+000	4.300e+001
10	5.801e+001	4.953e+001	3.019e+001	7.285e+000	9.000e+000	4.500e+001
11	5.231e+001	4.338e+001	2.924e+001	6.563e+000	1.000e+001	4.700e+001
12	4.729e+001	3.833e+001	2.769e+001	5.937e+000	1.100e+001	4.900e+001
13	4.300e+001	3.379e+001	2.660e+001	5.400e+000	1.200e+001	5.100e+001
14	3.949e+001	3.012e+001	2.554e+001	4.956e+000	1.300e+001	5.300e+001
15	3.635e+001	2.747e+001	2.380e+001	4.558e+000	1.400e+001	5.500e+001
16	3.243e+001	2.431e+001	2.146e+001	4.067e+000	1.500e+001	5.700e+001
17	2.909e+001	2.199e+001	1.905e+001	3.653e+000	1.600e+001	5.900e+001
18	2.683e+001	2.087e+001	1.686e+001	3.365e+000	1.700e+001	6.100e+001
19	2.510e+001	1.987e+001	1.535e+001	3.149e+000	1.800e+001	6.300e+001
20	.395e+001	1.965e+001	1.369e+001	3.002e+000	1.900e+001	6.500e+001
	250e+001	1.889e+001	1.223e+001	2.823e+000	2.000e+001	6.700e+001
	122e+001	1.834e+001	1.068e+001	2.662e+000	2.100e+001	6.900e+001
	947e+001	1.717e+001	9.163e+000	2.440e+000	2.200e+001	7.000e+001
	95e+001	1.615e+001	7.604e+000	2.240e+000	2.300e+001	7.200e+001
	7e+001	1.540e+001	6.381e+000	2.092e+000	2.400e+001	7.400e+001
	9e+001	1.464e+001	5.652e+000	1.969e+000	2.500e+001	7.600e+001
	e+001	1.467e+001	4.842e+000	1.938e+000	2.600e+001	7.800e+001
	+001	1.324e+001	3.880e+000	1.733e+000	2.700e+001	8.000e+001
	+001	1.257e+001	3.245e+000	1.629e+000	2.800e+001	8.200e+001
	+001	1.164e+001	2.608e+000	1.496e+000	2.900e+001	8.400e+001
	001	1.027e+001	2.330e+000	1.323e+000	3.000e+001	8.600e+001
	000	9.231e+000	1.976e+000	1.185e+000	3.100e+001	8.800e+001
	00	8.201e+000	1.393e+000	1.045e+000	3.200e+001	9.000e+001
	00	6.757e+000	1.215e+000	8.615e-001	3.300e+001	9.200e+001
	0	4.478e+000	9.663e-001	5.754e-001	3.400e+001	9.400e+001
		3.125e+000	4.576e-001	3.961e-001	3.500e+001	9.600e+001
		3.331e+000	2.837e-001	4.197e-001	3.600e+001	9.800e+001
38		3.145e+000	5.852e-001	4.013e-001	3.700e+001	1.000e+002
39		3.414e+000	3.017e-001	4.302e-001	3.800e+001	1.020e+002
40	3	3.221e+000	6.071e-001	4.112e-001	3.900e+001	1.040e+002
41	3.	3.170e+000	4.388e-001	4.014e-001	4.000e+001	1.060e+002
42	2.	2.734e+000	5.049e-001	3.493e-001	4.100e+001	1.070e+002
43	3.7	.709e+000	4.453e-001	4.687e-001	4.200e+001	1.090e+002
44	2.9	966e+000	4.007e-001	3.758e-001	4.300e+001	1.110e+002
45	2.8	836e+000	3.997e-001	3.593e-001	4.400e+001	1.140e+002
46	3.18	061e+000	8.930e-001	4.001e-001	4.500e+001	1.150e+002
47	3.646	46e+000	8.480e-001	4.571e-001	4.600e+001	1.170e+002
48	3.862	05e+000	1.092e+000	4.844e-001	4.700e+001	1.190e+002
49	4.286e	2e+000	8.894e-001	5.380e-001	4.800e+001	1.210e+002
50	5.749e-	3e+000	1.412e+000	7.210e-001	4.900e+001	1.220e+002

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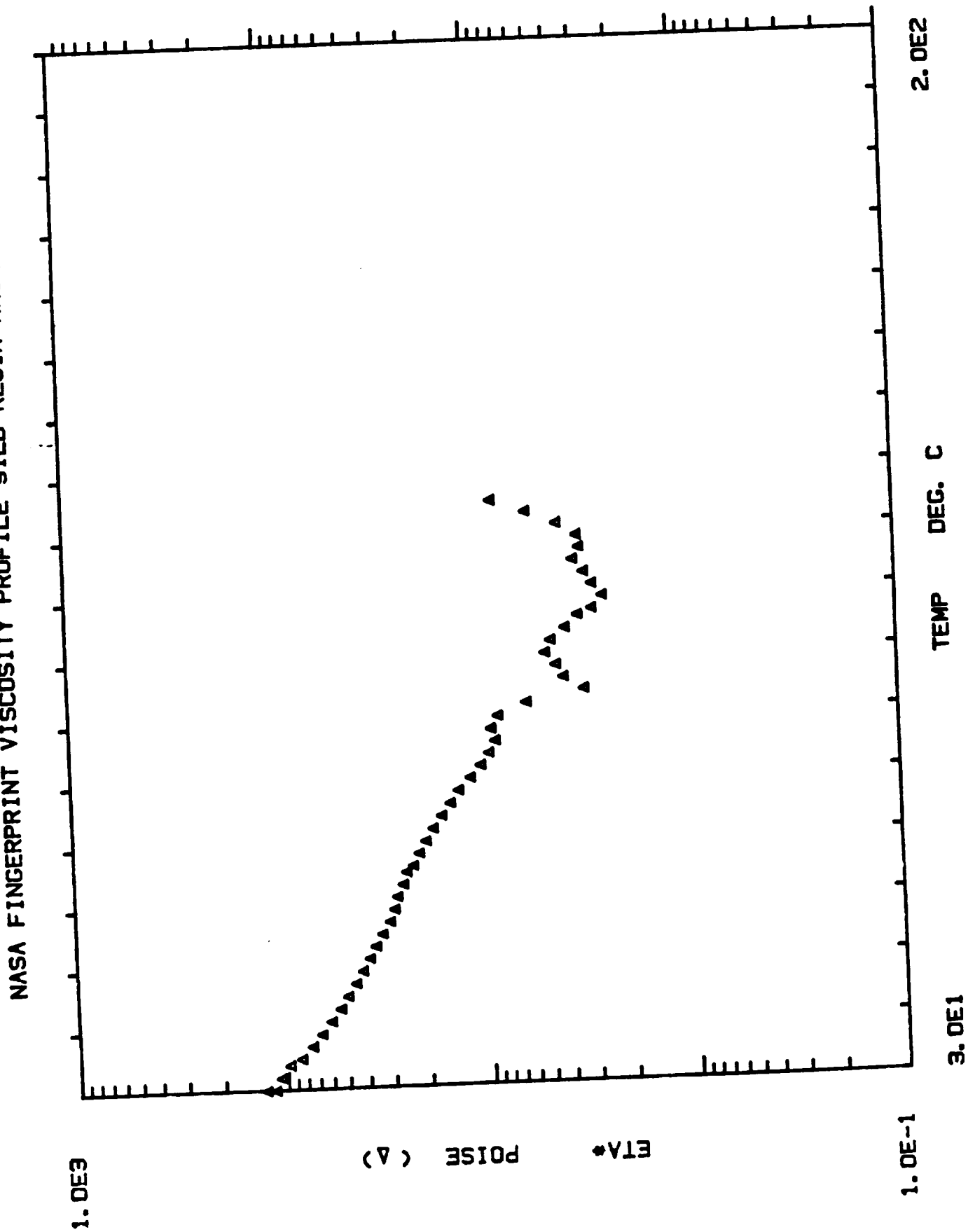
OF POOR QU

FINGERPRINT VISCOSITY PROFILE_YILD RESIN_NASA EQ12_1

	ETA* POISE	ETA' POISE	ETA" POISE	TORQUE GRAMS-CM	TIME MIN.	TEMP DEG. C
1	7.552e+000	7.303e+000	1.925e+000	9.483e-001	5.000e+001	1.240e+002

CHART 14B


NASA FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT2-2
1.0E3
ETA* POISE (A)
1.0E-1
2.0E2
TEMP DEG. C
3.0E1

xperiment No. : 13 Sample No. : 1

i..e:
ASA FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT2-2

r stor :CP

a+e and Time : Tuesday, August 19, 1986 - 14:59:08

perating Mode : DYNAMIC

Wi ep Type : CURE

eometry : DISK & PLATE
RADIUS : 25.00
GAP : 0.50

D' es :
TRAIN =50%
REQUENCY =10RAD/SEC

ORIGINAL PAGE IS
OF POOR QUALITY

A S FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT2-2

	ETA* POISE	ETA' POISE	ETA" POISE	TORQUE GRAMS-CM	TIME MIN.	TEMP DEG. C
1	1.243e+002	1.142e+002	4.916e+001	1.563e+001	2.000e-001	3.000e+001
2	1.124e+002	1.044e+002	4.176e+001	1.413e+001	1.000e+000	3.000e+001
	1.050e+002	9.702e+001	4.005e+001	1.319e+001	2.000e+000	3.200e+001
4	9.511e+001	8.625e+001	4.008e+001	1.194e+001	3.000e+000	3.400e+001
5	8.337e+001	7.435e+001	3.771e+001	1.047e+001	4.000e+000	3.500e+001
6	7.319e+001	6.376e+001	3.594e+001	9.186e+000	5.000e+000	3.700e+001
7	6.571e+001	5.591e+001	3.452e+001	8.254e+000	6.000e+000	3.900e+001
8	5.886e+001	4.855e+001	3.328e+001	7.387e+000	7.000e+000	4.100e+001
9	5.277e+001	4.229e+001	3.157e+001	6.628e+000	8.000e+000	4.300e+001
10	4.847e+001	3.784e+001	3.030e+001	6.087e+000	9.000e+000	4.500e+001
11	4.413e+001	3.299e+001	2.932e+001	5.539e+000	1.000e+001	4.700e+001
12	4.070e+001	2.954e+001	2.800e+001	5.108e+000	1.100e+001	4.900e+001
13	3.753e+001	2.622e+001	2.685e+001	4.710e+000	1.200e+001	5.100e+001
14	3.489e+001	2.439e+001	2.495e+001	4.380e+000	1.300e+001	5.300e+001
15	3.229e+001	2.221e+001	2.343e+001	4.047e+000	1.400e+001	5.500e+001
16	2.959e+001	2.080e+001	2.105e+001	3.711e+000	1.500e+001	5.700e+001
17	2.796e+001	2.016e+001	1.936e+001	3.507e+000	1.600e+001	5.900e+001
18	2.691e+001	1.968e+001	1.836e+001	3.375e+000	1.700e+001	6.100e+001
19	2.517e+001	1.887e+001	1.664e+001	3.157e+000	1.800e+001	6.300e+001
20	2.413e+001	1.841e+001	1.561e+001	3.025e+000	1.900e+001	6.500e+001
21	2.235e+001	1.801e+001	1.323e+001	2.803e+000	2.000e+001	6.600e+001
22	2.085e+001	1.751e+001	1.133e+001	2.613e+000	2.100e+001	6.800e+001
23	1.926e+001	1.660e+001	9.773e+000	2.416e+000	2.200e+001	7.000e+001
24	1.769e+001	1.571e+001	8.139e+000	2.220e+000	2.300e+001	7.200e+001
25	1.601e+001	1.443e+001	6.926e+000	2.011e+000	2.400e+001	7.400e+001
26	1.447e+001	1.331e+001	5.670e+000	1.816e+000	2.500e+001	7.600e+001
27	1.317e+001	1.218e+001	5.024e+000	1.654e+000	2.600e+001	7.800e+001
28	1.150e+001	1.079e+001	3.989e+000	1.443e+000	2.700e+001	8.000e+001
	1.019e+001	9.500e+000	3.674e+000	1.277e+000	2.800e+001	8.200e+001
30	9.266e+000	8.600e+000	3.451e+000	1.163e+000	2.900e+001	8.400e+001
31	8.599e+000	8.114e+000	2.847e+000	1.078e+000	3.000e+001	8.600e+001
32	9.007e+000	8.514e+000	2.937e+000	1.130e+000	3.100e+001	8.800e+001
33	8.291e+000	7.955e+000	2.335e+000	1.040e+000	3.200e+001	9.000e+001
34	5.992e+000	5.836e+000	1.361e+000	7.517e-001	3.300e+001	9.200e+001
35	3.143e+000	3.053e+000	7.494e-001	3.946e-001	3.400e+001	9.400e+001
36	3.942e+000	3.852e+000	8.381e-001	4.946e-001	3.500e+001	9.600e+001
37	4.281e+000	4.123e+000	1.152e+000	5.374e-001	3.600e+001	9.800e+001
38	4.815e+000	4.758e+000	7.412e-001	6.039e-001	3.700e+001	1.000e+002
39	4.494e+000	4.444e+000	6.690e-001	5.640e-001	3.800e+001	1.020e+002
40	3.810e+000	3.739e+000	7.308e-001	4.780e-001	3.900e+001	1.040e+002
41	3.292e+000	3.202e+000	7.622e-001	4.131e-001	4.000e+001	1.060e+002
42	2.810e+000	2.773e+000	4.544e-001	3.524e-001	4.100e+001	1.070e+002
43	2.487e+000	2.463e+000	3.422e-001	3.120e-001	4.200e+001	1.090e+002
44	2.787e+000	2.755e+000	4.215e-001	3.495e-001	4.300e+001	1.110e+002
45	3.037e+000	2.993e+000	5.058e-001	3.811e-001	4.400e+001	1.130e+002
46	3.421e+000	3.377e+000	5.464e-001	4.289e-001	4.500e+001	1.150e+002
47	3.175e+000	3.128e+000	5.477e-001	3.982e-001	4.600e+001	1.170e+002
48	3.242e+000	3.214e+000	4.294e-001	4.069e-001	4.700e+001	1.190e+002
49	4.047e+000	3.913e+000	1.030e+000	5.069e-001	4.800e+001	1.210e+002
50	5.702e+000	5.590e+000	1.128e+000	7.150e-001	4.900e+001	1.230e+002

NASA FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LBT2-2

	ETA* POISE	ETA' POISE	ETA" POISE	TORQUE GRAMS-CM	TIME MIN.	TEMP DEG. C
1	8.369e+000	8.150e+000	1.899e+000	1.048e+000	5.000e+001	1.250e+002

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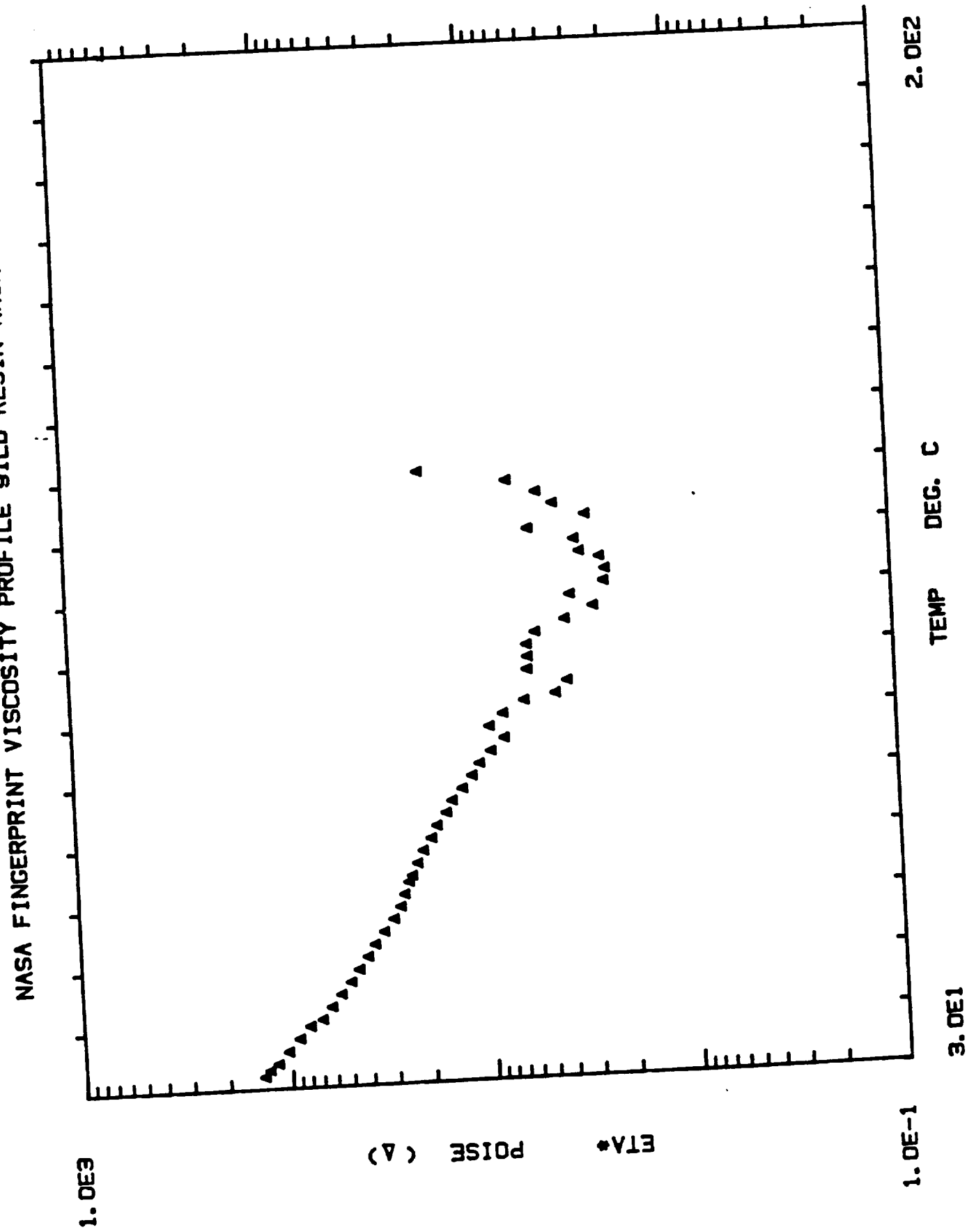
CHART 14C


NASA FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT2-3
ETA* POISE (A)
TEMP DEG. C
1.0E3
1.0E-1
3.0E1
2.0E2

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OF POOR QUALITY

Rheometrics RECAP II

p riment No. : 14 Sample No. : 1

tle:
r FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT2-3

perator :CRISTINA P

at and Time : Tuesday, August 19, 1986 - 16:16:38

perating Mode : DYNAMIC

we p Type : CURE

ecmetry : DISK & PLATE
RADIUS : 25.00
GAP : 0.50

ni es :

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NASA FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT2-3

NO.	ETA* POISE	ETA' POISE	ETA" POISE	TORQUE GRAMS-CM	TIME MIN.	TEMP DEG. C
1	1.351e+002	1.256e+002	4.992e+001	1.696e+001	2.000e-001	3.200e+001
2	1.344e+002	1.266e+002	4.521e+001	1.686e+001	1.000e+000	3.200e+001
3	1.268e+002	1.196e+002	4.216e+001	1.591e+001	2.000e+000	3.300e+001
4	1.152e+002	1.081e+002	3.982e+001	1.446e+001	3.000e+000	3.400e+001
5	1.022e+002	9.490e+001	3.799e+001	1.282e+001	4.000e+000	3.600e+001
6	8.971e+001	8.175e+001	3.696e+001	1.125e+001	5.000e+000	3.800e+001
7	7.926e+001	7.087e+001	3.550e+001	9.945e+000	6.000e+000	4.000e+001
8	6.897e+001	6.003e+001	3.397e+001	8.650e+000	7.000e+000	4.100e+001
9	6.157e+001	5.200e+001	3.296e+001	7.728e+000	8.000e+000	4.300e+001
10	5.522e+001	4.550e+001	3.128e+001	6.926e+000	9.000e+000	4.500e+001
11	4.913e+001	3.904e+001	2.982e+001	6.164e+000	1.000e+001	4.700e+001
12	4.464e+001	3.422e+001	2.867e+001	5.602e+000	1.100e+001	4.900e+001
13	4.033e+001	2.964e+001	2.735e+001	5.057e+000	1.200e+001	5.100e+001
14	3.706e+001	2.634e+001	2.606e+001	4.652e+000	1.300e+001	5.300e+001
15	3.322e+001	2.355e+001	2.343e+001	4.165e+000	1.400e+001	5.500e+001
16	2.965e+001	2.132e+001	2.060e+001	3.718e+000	1.500e+001	5.700e+001
17	2.734e+001	1.993e+001	1.872e+001	3.427e+000	1.600e+001	5.900e+001
18	2.603e+001	1.949e+001	1.726e+001	3.268e+000	1.700e+001	6.100e+001
19	2.466e+001	1.901e+001	1.570e+001	3.094e+000	1.800e+001	6.300e+001
20	2.363e+001	1.883e+001	1.428e+001	2.965e+000	1.900e+001	6.400e+001
21	2.217e+001	1.829e+001	1.254e+001	2.780e+000	2.000e+001	6.600e+001
22	2.071e+001	1.778e+001	1.061e+001	2.598e+000	2.100e+001	6.800e+001
23	1.861e+001	1.656e+001	8.917e+000	2.359e+000	2.200e+001	7.000e+001
24	1.760e+001	1.597e+001	7.383e+000	2.208e+000	2.300e+001	7.200e+001
25	1.574e+001	1.449e+001	6.153e+000	1.976e+000	2.400e+001	7.400e+001
26	1.466e+001	1.367e+001	5.297e+000	1.840e+000	2.500e+001	7.600e+001
27	1.299e+001	1.226e+001	4.304e+000	1.631e+000	2.600e+001	7.800e+001
28	1.160e+001	1.108e+001	3.442e+000	1.456e+000	2.700e+001	8.000e+001
29	1.064e+001	1.011e+001	3.305e+000	1.335e+000	2.800e+001	8.200e+001
30	9.289e+000	8.890e+000	2.695e+000	1.165e+000	2.900e+001	8.400e+001
31	7.952e+000	7.710e+000	1.948e+000	9.980e-001	3.000e+001	8.600e+001
32	9.383e+000	8.947e+000	2.828e+000	1.179e+000	3.100e+001	8.800e+001
33	8.005e+000	7.707e+000	2.163e+000	1.004e+000	3.200e+001	9.000e+001
34	6.270e+000	6.029e+000	1.721e+000	7.872e-001	3.300e+001	9.200e+001

36	3.827e+000	3.777e+000	6.155e-001	4.806e-001	3.500e+001	9.500e+001
37	6.006e+000	5.839e+000	1.409e+000	7.535e-001	3.600e+001	9.700e+001
38	5.933e+000	5.725e+000	1.560e+000	7.447e-001	3.700e+001	9.900e+001
39	5.959e+000	5.798e+000	1.376e+000	7.473e-001	3.800e+001	1.010e+002
40	5.391e+000	5.287e+000	1.057e+000	6.766e-001	3.900e+001	1.030e+002
41	3.839e+000	3.688e+000	1.068e+000	4.817e-001	4.000e+001	1.050e+002
42	2.768e+000	2.534e+000	1.114e+000	3.474e-001	4.100e+001	1.070e+002
43	3.582e+000	3.517e+000	6.770e-001	4.496e-001	4.200e+001	1.090e+002
44	2.437e+000	2.379e+000	5.280e-001	3.056e-001	4.300e+001	1.110e+002
45	2.386e+000	2.258e+000	7.710e-001	2.994e-001	4.400e+001	1.130e+002
46	2.529e+000	2.486e+000	4.632e-001	3.171e-001	4.500e+001	1.150e+002
47	3.162e+000	3.068e+000	7.642e-001	3.967e-001	4.600e+001	1.160e+002
48	3.335e+000	3.251e+000	7.428e-001	4.178e-001	4.700e+001	1.180e+002
49	5.591e+000	5.426e+000	1.349e+000	7.010e-001	4.800e+001	1.200e+002
50	2.915e+000	2.873e+000	4.928e-001	3.657e-001	4.900e+001	1.220e+002

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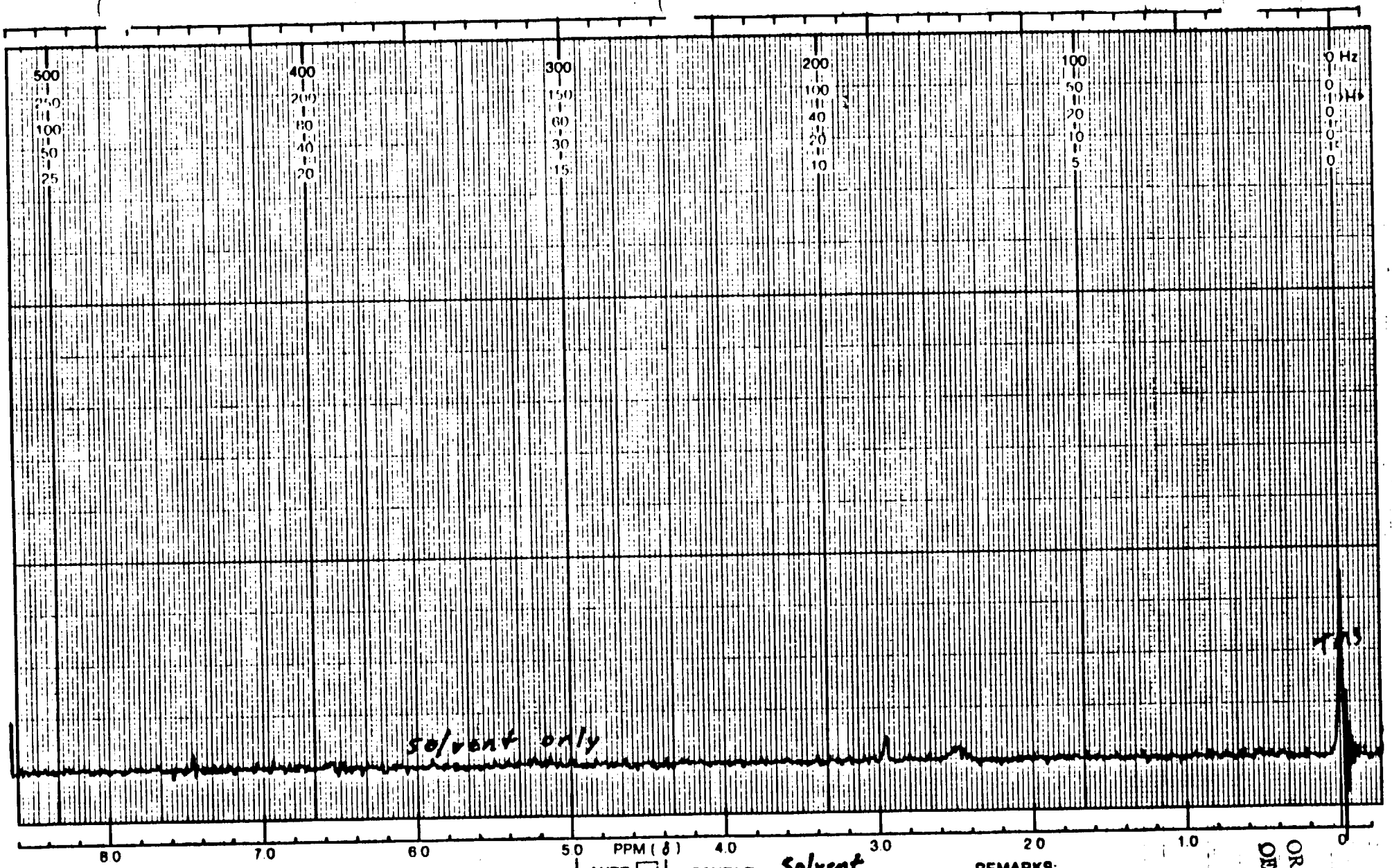
NASA FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT2-3

NO.	ETA* POISE	ETA' POISE	ETA" POISE	TORQUE GRAMS-CM	TIME MIN.	TEMP DEG. C
1	4.183e+000	4.073e+000	9.518e-001	5.246e-001	5.000e+001	1.240e+002
2	5.029e+000	4.881e+000	1.211e+000	6.309e-001	5.100e+001	1.260e+002
53	6.973e+000	6.753e+000	1.739e+000	8.739e-001	5.200e+001	1.280e+002
54	1.866e+001	1.754e+001	6.376e+000	2.340e+000	5.300e+001	1.300e+002



SWEEP OFFSET (Hz): 0
SPECTRUM AMPLITUDE: 8.0
INTEGRAL AMPLITUDE: —
SPINNING RATE (RPS): 30

MANUAL
SWEEP TIME (SEC): 50 250 500 1000
SWEEP WIDTH (Hz): 25 50 100 250 500
FILTER: 1 2 3 4 5 6 7 8
RF POWER LEVEL: 0.30

AUTO ☐
(250)
(500)
(2)
(.05)

SAMPLE: Solvent
SOLVENT: Unisol-d + 0.62% TMS
DEC. LEVEL

REMARKS:

SOLVENT ONLY SCAN

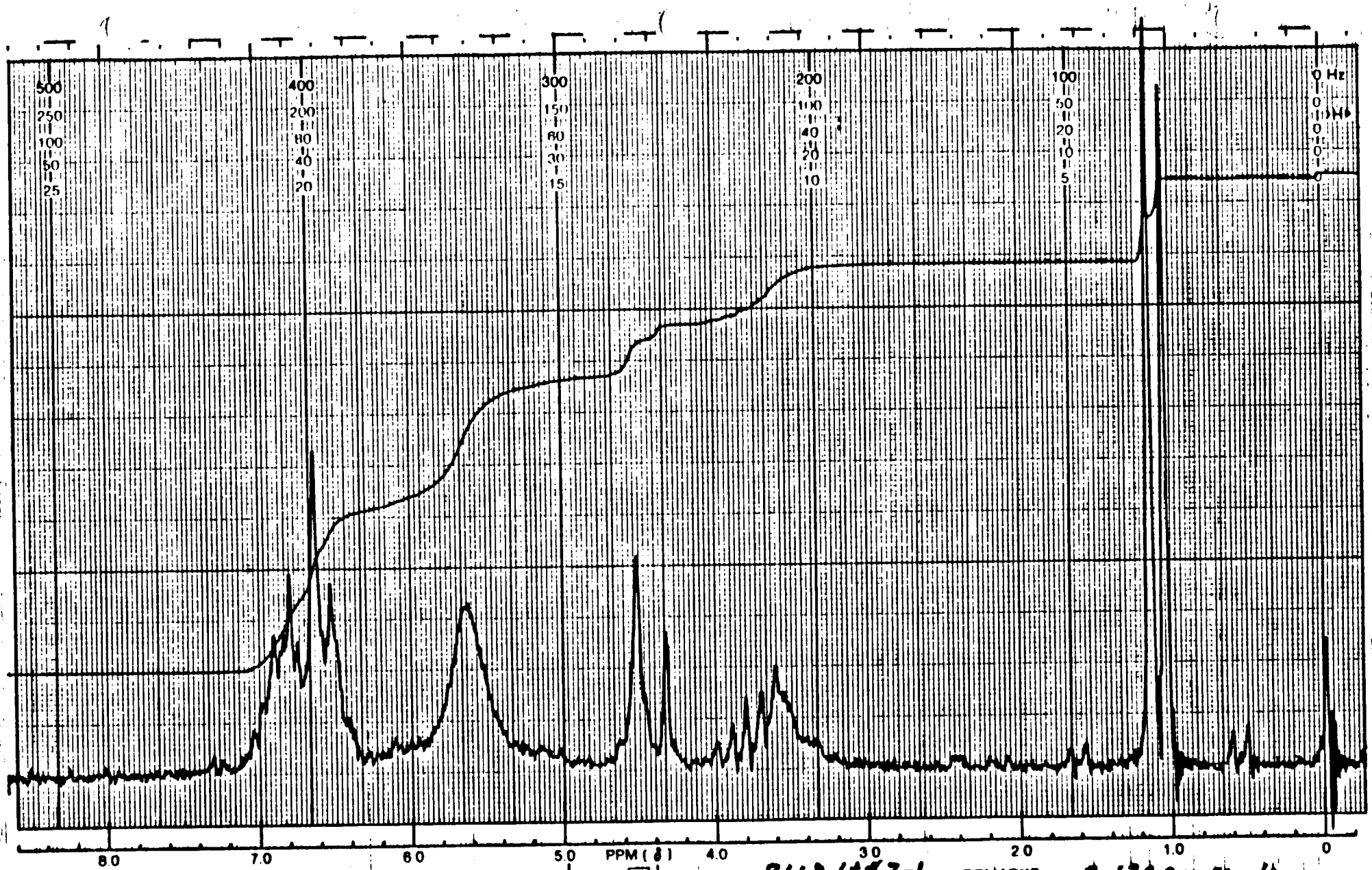
ORIGINAL PAGE IS OF POOR QUALITY.

NORELL, INC.
LANDISVILLE, N.J. 08326
Phone: (609) 697-0020

DATE: 3-21-86

OPERATOR DGW

SPECTRUM NO. 1A of 7
solvent scans



SWEEP OFFSET (Hz): 0
SPECTRUM AMPLITUDE: 8.0
INTEGRAL AMPLITUDE: 5.0
SPINNING RATE (RPS): 30

MANUAL
SWEEP TIME (SEC): 30 250 500 1000
SWEEP WIDTH (Hz): 25 50 100 750 500
FILTER: 1 2 3 4 5 6 7 8
RF POWER LEVEL: 0.25

AUTO ☐
(250)
(500)
(2)
(.05)

SAMPLE: 91LD Lot #2-1
SOLVENT: Unisol-d + 0.62 TMS
DEC. LEVEL

REMARKS: 0.130 gm sample
0.846 gm solvent

DATE: 3-21-86
OPERATOR DGW
SPECTRUM NO 4 of 9 91LD Lot #2-1

NORELL, INC.
LANDISVILLE, N.J. 08326
T60 Phone: (609) 697-0020

CHART 15A

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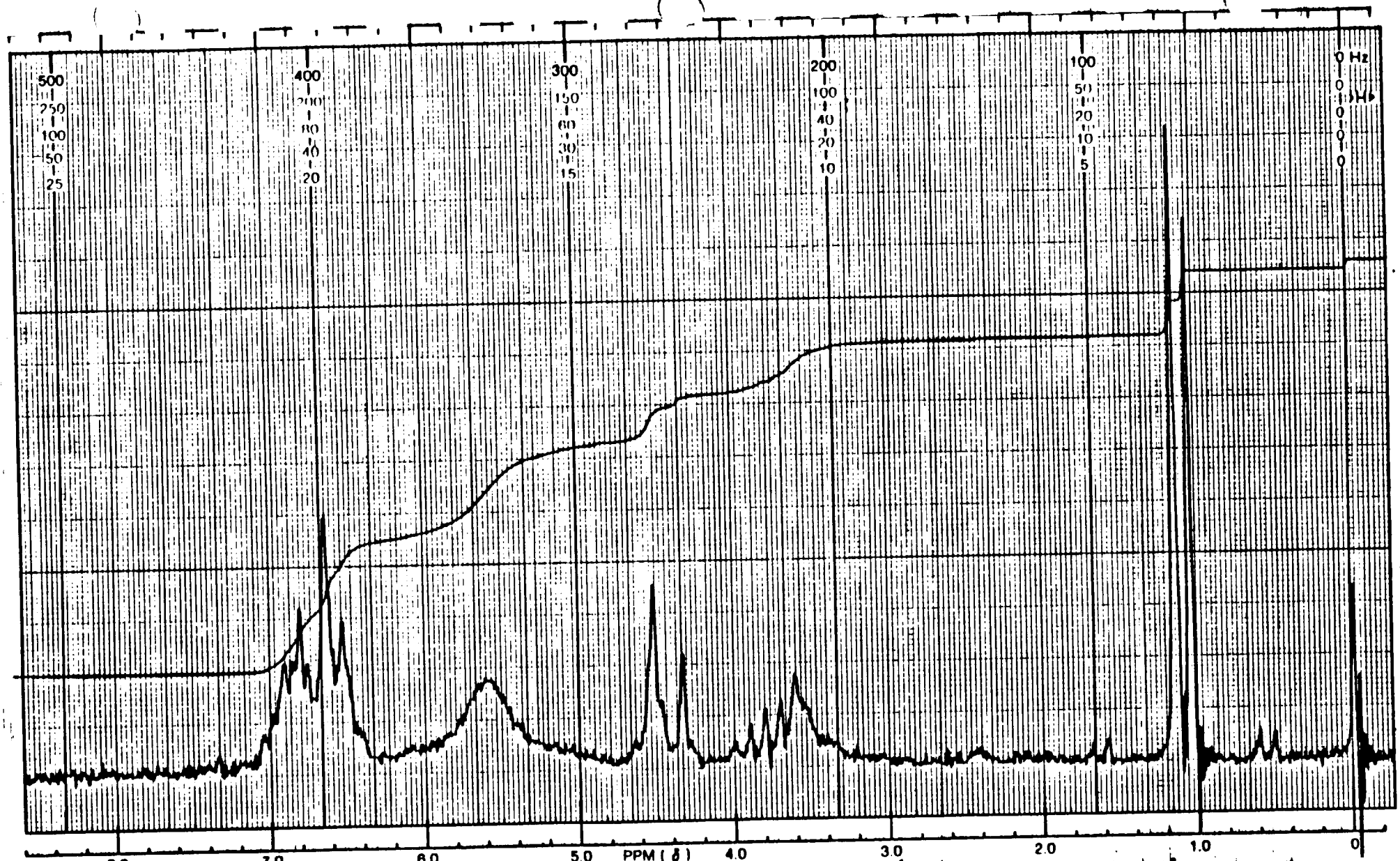

SWEEP OFFSET (Hz): 0
SPECTRUM AMPLITUDE: 8.0
INTEGRAL AMPLITUDE: 5.0
SPINNING RATE (RPS): 30

MANUAL
SWEEP TIME (SEC): 30 250 500 1000
SWEEP WIDTH (Hz): 25 50 100 250 500
FILTER: 1 2 3 4 5 6 7 8
RF POWER LEVEL: 0.25

AUTO ☐
(250)
(500)
(2)
(.05)

SAMPLE: 91LD Lot #2-2
SOLVENT: Unisol-d+0.5% TMS
DEC. LEVEL

REMARKS: 0.114 gm sample
0.946 gm solvent

DATE: 3-21-86
OPERATOR DBW
SPECTRUM NO. 5 of 9 91LD Lot #2-2

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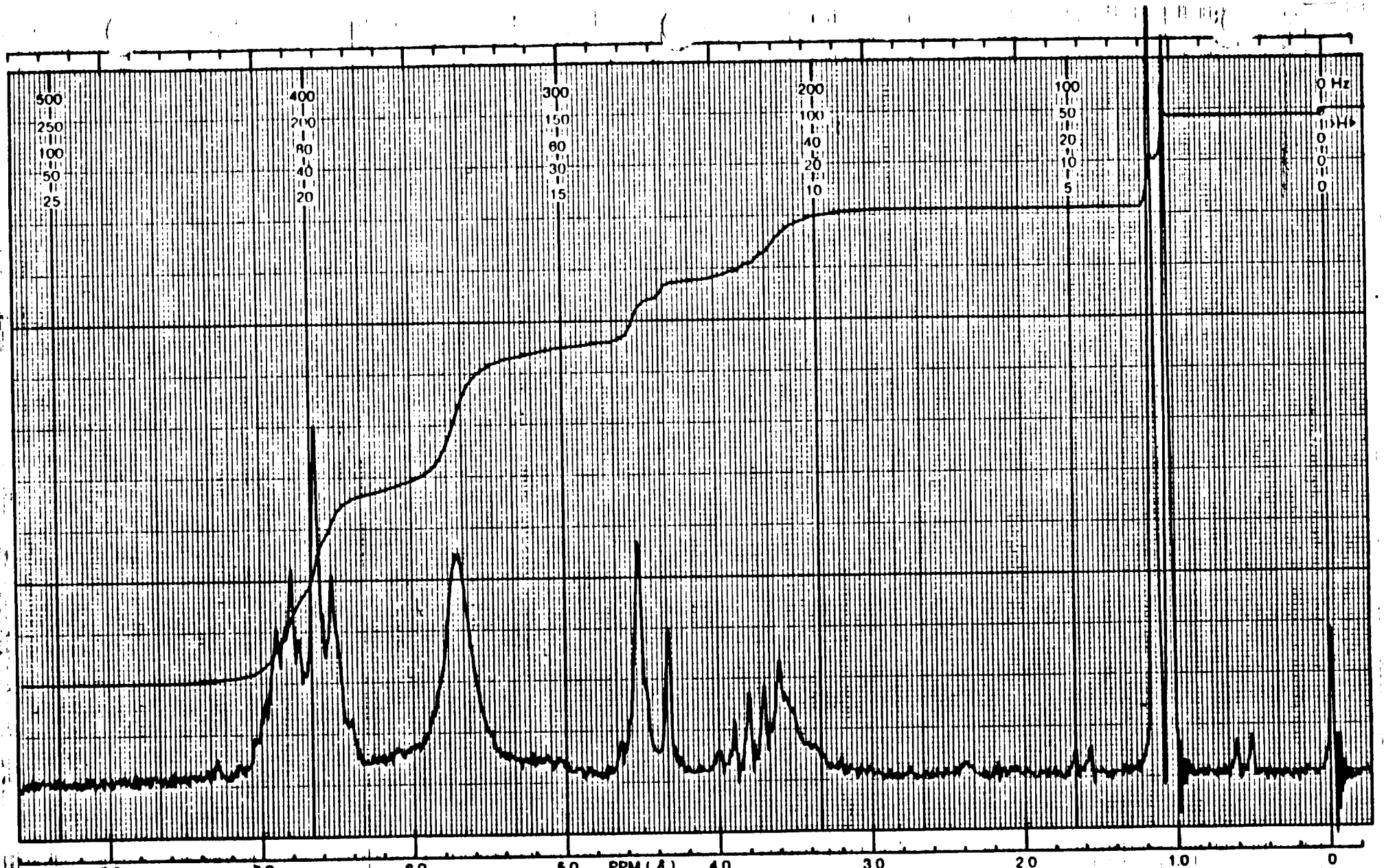
CHART 15B

NORELL, INC.
LANDISVILLE, N.J. 08326
TFO Phone: (609) 697-0020



SWEEP OFFSET (Hz): 0

SPECTRUM AMPLITUDE: 8.0

INTEGRAL AMPLITUDE: 5.0

SPINNING RATE (RPS): 20

MANUAL

SWEEP TIME (SEC): 30 250 500 1000

SWEEP WIDTH (Hz): 25 50 100 250 500

FILTER: 1 2 3 4 5 6 7 8

RF POWER LEVEL: 0.25

AUTO ☐

(250)

(500)

(2)

(.05)

SAMPLE: 91LD Lt#2-3

SOLVENT: Uniad-d+0.52TMS

DEC. LEVEL

REMARKS: 0.136 gm sample
0.775 gm solvent

ORIGINAL PAGE IS OF POOR QUALITY

CHART 15C

NORELL, INC.
LANDISVILLE, N.J. 08326
Phone: (609) 697-0020

DATE: 3-21-86

OPERATOR DGW

SPECTRUM NO. 6 of 9 91LD Lt# 2-3

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FABRIC TESTING

NAS8-36298

U.S. Polymeric O.E. 71108

CCA-3 Fabric for NASA Lot# 2

CHARTS

U.S. Polymeric

FABRIC TESTING

NAS8-36298

U.S. POLYMERIC O.E. 71108

CCA-3 Fabric for NASA Lot# 2

1a. Breaking Strength, lbs/in, WARP
ASTM D1682

	#2-1S	#2-1E	#2-2S
PICK	32	35	41
CENTER	34	28	30
PLAIN	31	33	45
AVG.	32.3	32.0	38.7

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
PICK	31	39	35	31	30
CENTER	28	41	33	32	29
PLAIN	33	39	36	32	33
AVG.	30.7	39.7	34.7	31.7	30.7

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
	38	37	36	37	35.2
CENTER	36	38	33	32	32.8
PLAIN	32	36	42	32	35.3
AVG.	35.3	37.0	37.0	33.7	34.4

1b. Breaking Strength, lbs/in, FILL
ASTM D1682

	#2-1S	#2-1E	#2-2S
PICK	13	22	16
CENTER	16	23	15
PLAIN	21	25	16
AVG.	16.7	23.3	15.7

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
PICK	20	21	22	22	28
CENTER	24	16	20	21	26
PLAIN	22	23	14	26	24
AVG.	22.0	20.0	18.7	23.0	26.0

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
PICK	25	27	20	18	21.2
CENTER	29	22	22	20	21.2
PLAIN	25	29	22	20	22.3
AVG.	26.3	26.0	21.3	19.3	21.5

2a. Carbon Assay, %
MDQAI 5560

	#2-1S	#2-1E	#2-2S
PICK	97.0	96.6	97.1
CENTER	96.8	96.8	96.5
PLAIN	97.2	96.8	96.5
AVG.	97.00	96.73	96.70

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
PICK	96.7	96.9	96.6	96.6	96.7
CENTER	96.5	96.4	96.6	96.6	96.6
PLAIN	96.8	96.7	96.8	96.5	96.1
AVG.	96.67	96.67	96.67	96.57	96.47

HITCO MATERIALS DIVISION
700 E. DYER ROAD, SANTA ANA, CALIFORNIA 92707 • (714) 549-1101 • TWX (910) 595-1130 • FAX # (714) 549-2858-5-2437

CCA-3 Fabric for NASA Lot# 2

2a. Carbon Assay, % (CONTINUED)
MDQAI 5560

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
PICK	97.2	97.0	97.2	96.7	96.86
CENTER	97.2	97.4	97.2	96.7	96.78
PLAIN	96.8	97.3	96.7	96.4	96.72
AVG.	97.07	97.23	97.03	96.60	96.78

2b. Hydrogen Assay, %
MDQAI 5560

	#2-1S	#2-1E	#2-2S
PICK	.15	.14	.14
CENTER	.14	.14	.14
PLAIN	.14	.13	.14
AVG.	.143	.137	.140

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
PICK	.15	.14	.15	.15	.17
CENTER	.14	.15	.14	.14	.15
PLAIN	.14	.14	.14	.14	.13
AVG.	.143	.143	.143	.143	.150

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
PICK	.13	.13	.13	.15	.144
CENTER	.12	.12	.11	.13	.135
PLAIN	.13	.12	.12	.14	.134
AVG.	.127	.123	.120	.140	.138

2c. Nitrogen Assay, %
MDQAI 5560

	#2-1S	#2-1E	#2-2S
PICK	.9	.9	.8
CENTER	.9	.8	.9
PLAIN	.8	.9	.9
AVG.	.87	.87	.87

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
PICK	1.0	1.0	1.0	1.0	1.0
CENTER	1.0	.9	.8	.9	.9
PLAIN	1.0	.9	.8	.8	.8
AVG.	1.00	.93	.87	.90	.90

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
PICK	.8	.7	.8	.7	.88
CENTER	.8	.8	.8	.8	.86
PLAIN	.8	.7	.9	.8	.84
AVG.	.80	.73	.83	.77	.86

3. Visual Inspection
QCi-102

See Charts 3A-3F

4. Specific Gravity, Units
PTM-84

(NOTE: Results are not reliable due to surface reliability)

	#2-1S	#2-1E	#2-2S
	3.5869	3.1237	3.9585
	3.5685	3.1424	3.9578
	3.6303	3.0861	3.9017
AVG.	3.595	3.117	3.939

CCA-3 Fabric for NASA Lot# 2

4. Specific Gravity, Units (CONTINUED)
PTM-84

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
	2.7368	2.7120	3.0102	2.8538	3.4570
	2.7372	2.9321	3.0151	2.7906	3.5031
	2.7623	2.9903	2.8179	2.7711	3.1211
AVG.	2.745	2.878	2.948	2.805	3.360

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
	3.4576	3.1998	3.6452	3.0166	3.2298
	3.4282	3.5782	3.6616	3.3366	3.3043
	3.4942	3.3929	3.6568	3.2870	3.2426
AVG.	3.460	3.390	3.655	3.213	3.259

5. pH, Units
CTM-24B

	#2-1S	#2-1E	#2-2S
	8.0	8.2	10.0
	8.0	8.2	10.0
AVG.	8.00	8.20	10.00

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
	9.8	9.2	9.1	9.0	9.0
	9.8	9.0	9.0	8.9	8.9
AVG.	9.80	9.10	9.05	8.95	8.95

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
	8.5	8.6	8.0	7.8	8.77
	8.4	8.5	7.8	7.8	8.69
AVG.	8.45	8.55	7.90	7.80	8.73

6. TGA, •C at 50% Weight Loss
CTM-51 (AIR)

SET UP #1	
2-4S	694
2-5S	699
2-6Z	699
AVG.	697

SET UP #2			
2-1S	577	2-3S	603
2-1E	600	2-3E	597
2-2S	588	2-4E	581
2-2E	589	2-5E	581
		2-6E	585
		AVG.	589

See Charts 6A-6L

7a. Atomic Absorption, ppm
CTM-53B

	#2-1S	#2-1E	#2-2S
Na	842	1027	956
K	45	50	45
Ca	6	6	8
Mg	45	55	70
Li	0	0	0
AVG.	938	1138	1079

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
Na	801	844	847	811	833
K	37	36	44	43	35
Ca	7	6	6	8	8
Mg	72	50	45	56	45
Li	0	0	0	0	0
AVG.	917	936	942	918	921

CCA-3 Fabric for NASA Lot# 2

7a. Atomic Absorption, ppm (CONTINUED)
CTM-53B

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
Na	524	563	423	495	747.2
K	36	45	45	43	42.0
Ca	8	8	9	8	7.3
Mg	84	47	61	53	56.9
Li	0	0	0	0	0
AVG.	652	663	538	599	853.4

7b. Moisture Content, %
CTM-53B

#2-1S	2.272	#2-4S	1.925
#2-1E	2.497	#2-4E	1.938
#2-2S	2.271	#2-5S	1.738
#2-2E	2.104	#2-5E	1.701
#2-3S	2.178	#2-6S	1.625
#2-3E	2.056	#2-6E	1.888
	Lot# 2	AVERAGE	2.016

7c. Ash Content, %
CTM-53B

#2-1S	.370	#2-4S	.382
#2-1E	.408	#2-4E	.328
#2-2S	.398	#2-5S	.209
#2-2E	.357	#2-5E	.242
#2-3S	.351	#2-6S	.276
#2-3E	.377	#2-6E	.242
	Lot# 2	AVERAGE	.328

8a. Filament diameter, microns, WARP
S.E.M. procedure
(diameters are an average 10 measurements)

	#2-1S	#2-2S	#2-3S
AVERAGE	9.87	10.31	10.13
Minimum	6.65	7.50	9.35
Maximum	10.40	14.05	11.50
Std. Dev	1.14	1.93	0.68

	#2-4S	#2-5S	#2-6S	LOT2 AVG
AVERAGE	10.27	10.60	10.52	10.28
Minimum	9.35	9.35	8.50	6.65
Maximum	11.25	12.65	12.25	14.05
Std. Dev	0.56	0.95	1.09	1.12

8b. Filament diameter, microns, FILL
S.E.M. procedure
(diameters are an average of 10 measurements)

	#2-1S
AVERAGE	10.26
Minimum	9.05
Maximum	12.25
Std. Dev	0.97

9a. Thread Count, per inch, WARP
PTM-5A

	#2-1S	#2-1E	#2-2S
	52	52	52
	51	52	52
	52	51	52
	52	50	52
	53	52	54
AVG.	52.0	51.4	52.4

CCA-3 Fabric for NASA Lot# 2

9a. Thread Count, per inch, WARP (CONTINUED)
PTM-5A

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
	52	53	52	53	53
	51	52	51	53	53
	52	52	51	53	52
	51	52	52	53	52
	52	52	52	53	52
AVG.	51.6	52.2	51.6	53.0	52.4

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
	53	53	52	53	52.5
	52	53	52	52	52.0
	52	52	51	52	51.8
	52	53	52	52	51.9
	53	53	52	53	52.6
AVG.	52.4	52.8	51.8	52.4	52.2

9b. Thread Count, per inch, FILL
PTM-5A

	#2-1S	#2-1E	#2-2S
	49	49	49
	50	49	49
	49	48	48
	49	49	49
	50	49	49
AVG.	49.4	48.8	48.8

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
	49	49	49	50	49
	48	50	49	49	49
	48	49	48	50	49
	48	49	49	50	49
	49	49	49	49	49
AVG.	48.4	49.2	48.8	49.6	49.0

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
	49	49	49	48	49.0
	49	49	49	49	49.1
	50	49	49	49	48.8
	49	49	48	49	48.9
	50	49	49	49	49.2
AVG.	49.4	49.0	48.8	48.8	49.0

10a. Areal weight as received, gm/4x4
PTM-3A

	#2-1S	#2-1E	#2-2S
LEFT	2.916	2.951	2.897
CENTER	2.922	2.945	2.846
RIGHT	2.933	2.959	2.890
AVG.	2.924	2.952	2.878

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
LEFT	2.873	2.942	2.969	2.921	2.897
CENTER	2.858	2.904	2.944	2.896	2.853
RIGHT	2.861	2.928	2.911	2.897	2.920
AVG.	2.864	2.925	2.941	2.905	2.890

CCA-3 Fabric for NASA Lot# 2

10a. Areal weight as received, gm/4x4 (CONTINUED)
PTM-3A

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
LEFT	2.898	2.951	2.833	2.901	2.912
CENTER	2.850	2.906	2.803	2.889	2.885
RIGHT	2.852	2.954	2.842	2.912	2.905
AVG.	2.867	2.937	2.826	2.901	2.901

10b. Volatiles as received, %
PTM-3A

	#2-1S	#2-1E	#2-2S
LEFT	5.76	5.59	5.11
CENTER	5.92	5.53	5.34
RIGHT	5.90	5.37	4.95
AVG.	5.86	5.50	5.13

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
LEFT	4.63	4.38	4.75	4.66	4.59
CENTER	4.90	4.82	5.30	4.45	4.28
RIGHT	4.82	5.09	4.95	4.80	4.45
AVG.	4.78	4.76	5.00	4.64	4.44

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
LEFT	3.76	3.59	3.78	4.21	4.57
CENTER	4.11	3.99	3.85	4.19	4.72
RIGHT	3.75	3.86	3.91	4.02	4.66
AVG.	3.87	3.81	3.85	4.14	4.65

10c. Weight Change on Acetone Wash, %
PTM-3A

	#2-1S	#2-1E	#2-2S
LEFT	-.07	.39	.76
CENTER	.18	.50	.78
RIGHT	.47	.57	.55
AVG.	.19	.49	.70

	#2-2E	#2-3S	#2-3E	#2-4S	#2-4E
LEFT	.69	.18	.21	-.04	-.40
CENTER	.77	.43	.36	-.33	-.44
RIGHT	.26	.25	.33	-.11	-.04
AVG.	.57	.29	.30	-.16	-.29

	#2-5S	#2-5E	#2-6S	#2-6E	LOT2 AVG
LEFT	-.14	.00	-.07	.00	.13
CENTER	-.07	-.04	-.04	-.14	.16
RIGHT	-.04	-.11	-.11	.00	.17
AVG.	-.08	-.05	-.07	-.05	.15

U.S. Polymeric

Hamid M. Quraishi, Manager
Quality Assurance Department

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USP NO. CHART 3A

FOOTAGE | COMMENT

LEFT

TREATER OPERATOR READ UP

DATE 5/8/86

FABRIC C3A 3

MFG. HITCO

ROLL NO. 18789

YARDS 162.1

POUNDS 94.4

ORDER NO. 71108

SPECIFICATION STW4-3184-SCN2

Q.C. FILE # NASA 2-1

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

NASA Roll # 2-1
START 2,1 END

GRADE Grup B

GARCIA

USP NO. CHART 3B

DATE 5/8/86

FABRIC CCA 3

MFG. HITCO

ROLL NO. 18778

YARDS 1582.5

POUNDS 1922

ORDER NO. 7108

SPECIFICATION STW4 3184-SCN2

Q.C. FILE # NASA 2-2

FOOTAGE	COMMENT
START Sample	
20	
40	
60 W	
80 W	
100 W	
120	
140 W	
160	
180 W	
200 W	
220 SPLICE	
240	
W	
280 W	
292	
312 SPLICE	
320	
342 W	
360 W	
380 W	
400 W	
420	
444 End Sample	
460	
480	
500	

TREATER OPERATOR READ UP

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

NASA Roll # 2-2
START and END

GRADE Group B

GARCIA

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USP NO. ___ CHART 3C

FOOTAGE
N S REMARK

DATE 5/8/86

FT HT

START Sample

20

0
47

0

80

100
W

120
W

140

160

180
W EVERY 1 FOOT

200

220
SPLICE

240

260
END

280

300

320

340

360

380

400
END Sample

420

440

460

480

500

TREATER OPERATOR READ UP

LEFT

FABRIC CCA 3

MFG. HITCO

ROLL NO. 1879/

YARDS 1540

POUNDS 94.7

ORDER NO. 71108

SPECIFICATION STW4 3184 SCN 2

Q.C. FILE # NASA 2-3

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

NASA Roll # 2-3
START and END

GRADE Grade B

GARCIA

USP NC

CHART 3D

FOOTAGE

RIGHT

LEFT

DATE 4/28/86

FABRIC CCA 3 4/3"

MFG. HITCO

ROLL NO. 18811

YARDS 150.0

POUNDS 90.2

ORDER NO. 71108

SPECIFICATION STW 4 3184 SCU 2-

Q.C. FILE # NASA 2-4

START Splice

20

40

60

80 75 W

100 114 W

120

140 156 W

160 163W 172 W 178 W

180

200 190W

206 BREAK SPLICE

220 233W 327W

240

260

280 295W

300 314W

320

340 340 W

360 373W

380

400 401 W

420 END Splice

440

460

480

500

TREATER OPERATOR READ UP

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

NASA Roll # 2-4

START and END

GRADE Group B

OPER

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USP NO. CHART 3E

DATE 5/8/86

FABRIC CCA 3 -43

MFG. HITCO

ROLL NO. 18790

YARDS 152.8

POUNDS 93.4

ORDER NO. 71108

SPECIFICATION STW4 3184-SCN2

Q.C. FILE # NASA 2-5

FOOTAGE

FOOTAGE	N	S	COMMENT	LEFT
		START Sample	5½ FROM EDGE	
20	30 W			
80	90 W			
120				
160	196 W			
200	220 BREAK SLIVER			
240	248 W			
280	284 286 W	W		
320				
360				
400				
420				
440	445 END	END Sample		
480				
500				

TREATER OPERATOR READ UP

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

NASA Roll # 2-5

START and END

GRADE Grade C

GARCIA

USP NO. CHART 3F

DATE 5/8/86

FABRIC CCA 3-43

MFG. HITCO

ROLL NO. 18788

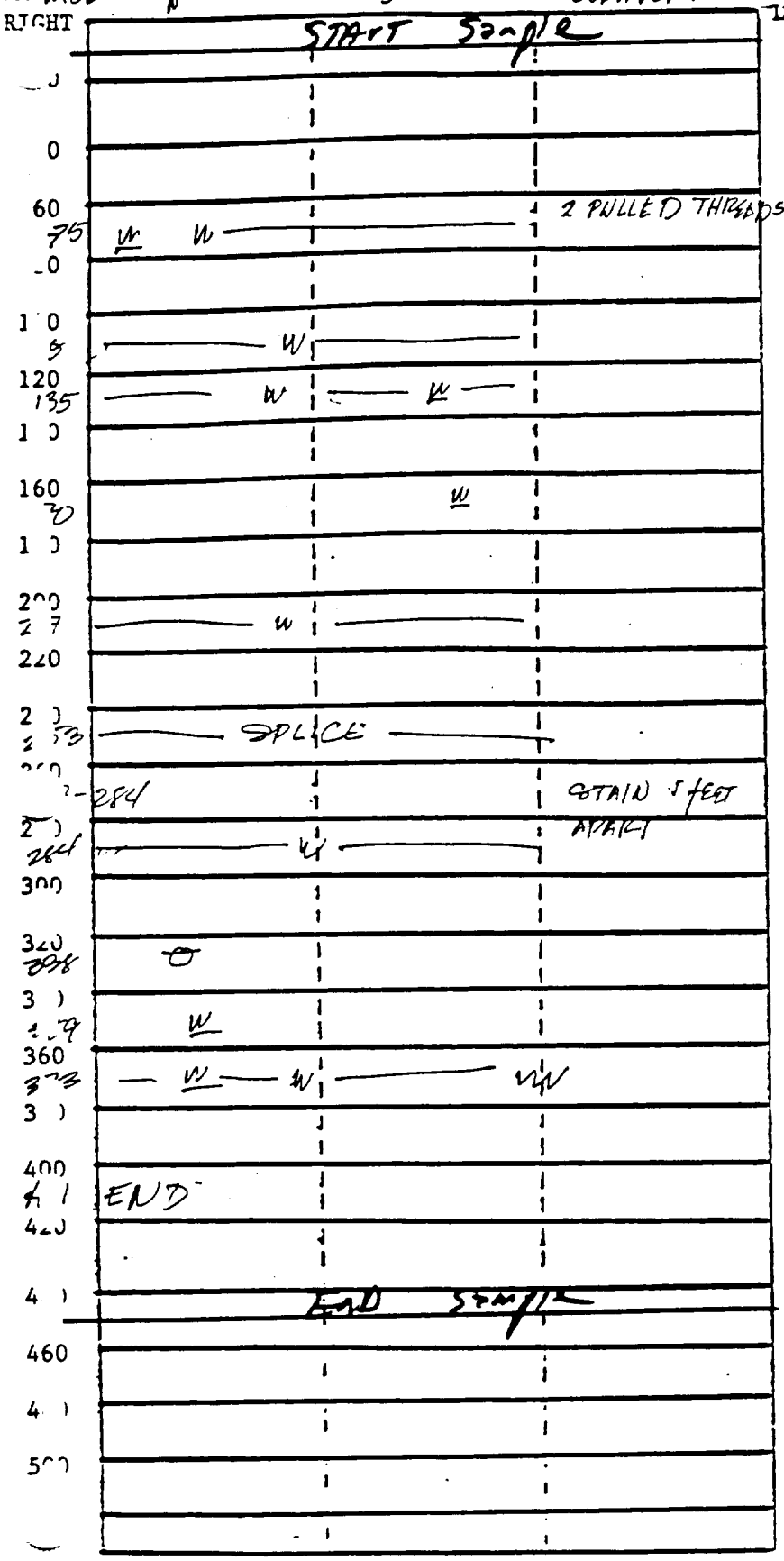
YARDS 155.6

POUNDS 94.9

ORDER NO. 71108

SPECIFICATION STW4 3184-SCN2

Q.C. FILE # NASA 2-6



SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

NASA Roll #2-6
START and END

GRADE Group B

GARCÍA

CHART 6A

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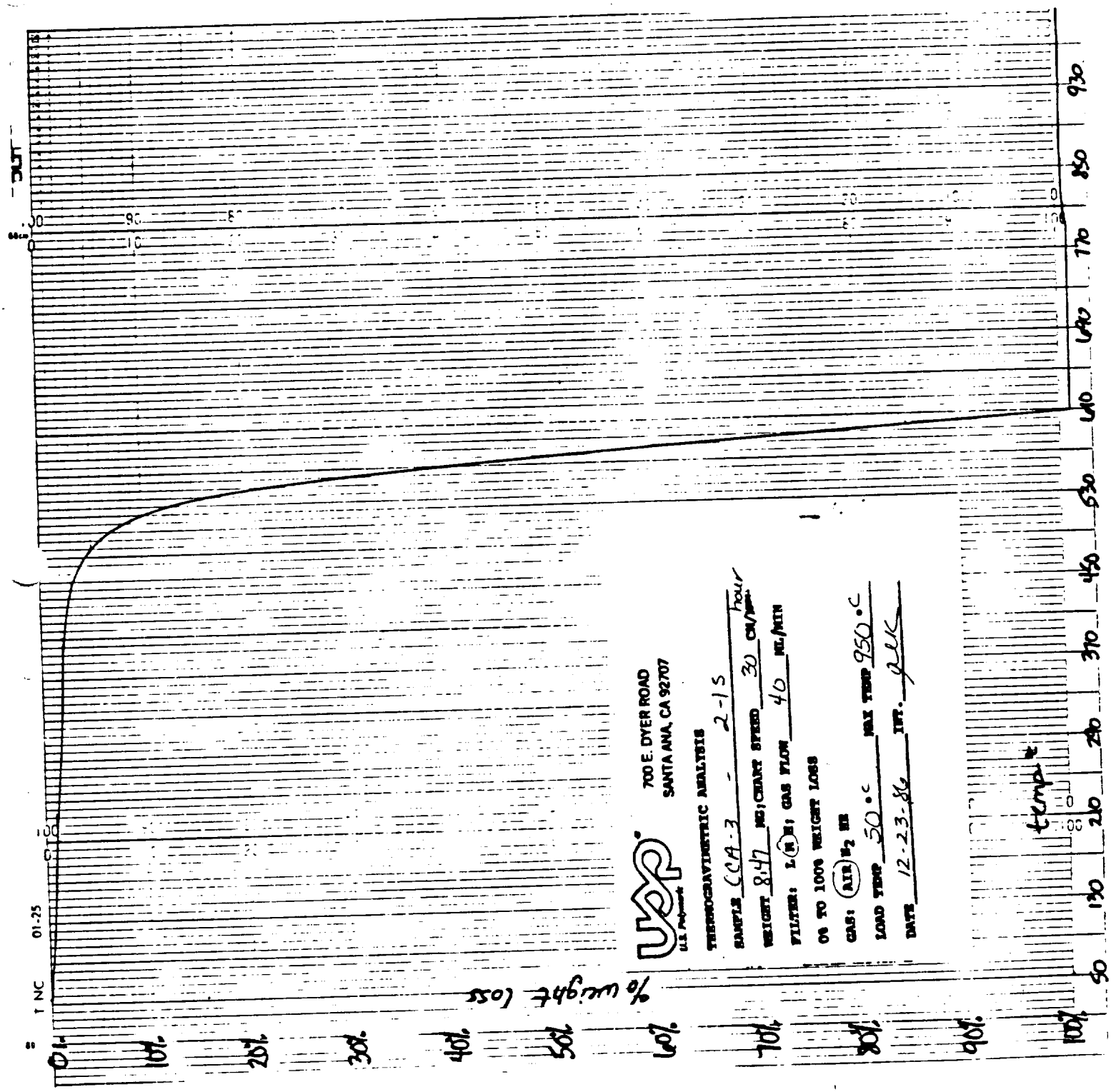

CHART 6B

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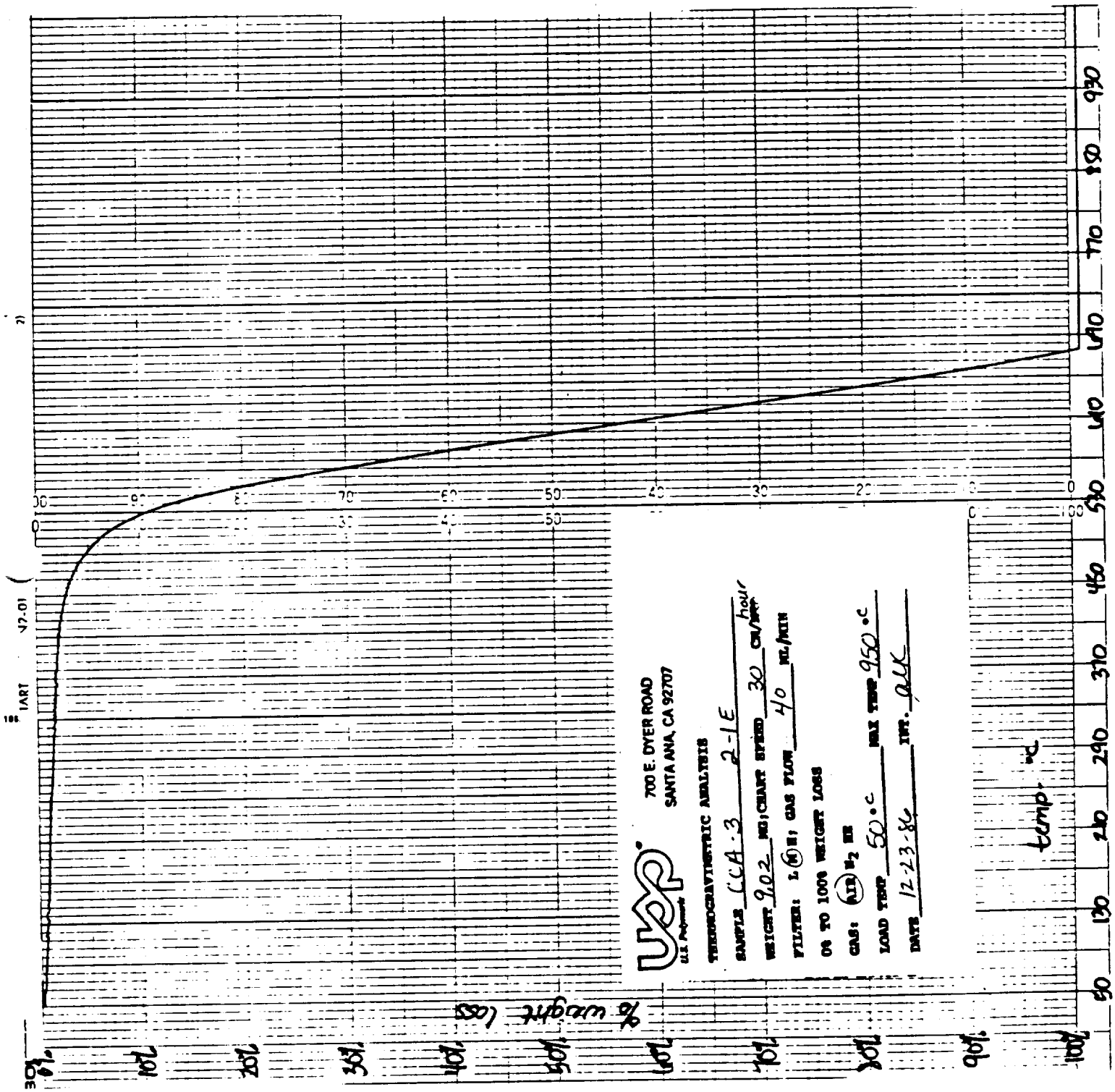

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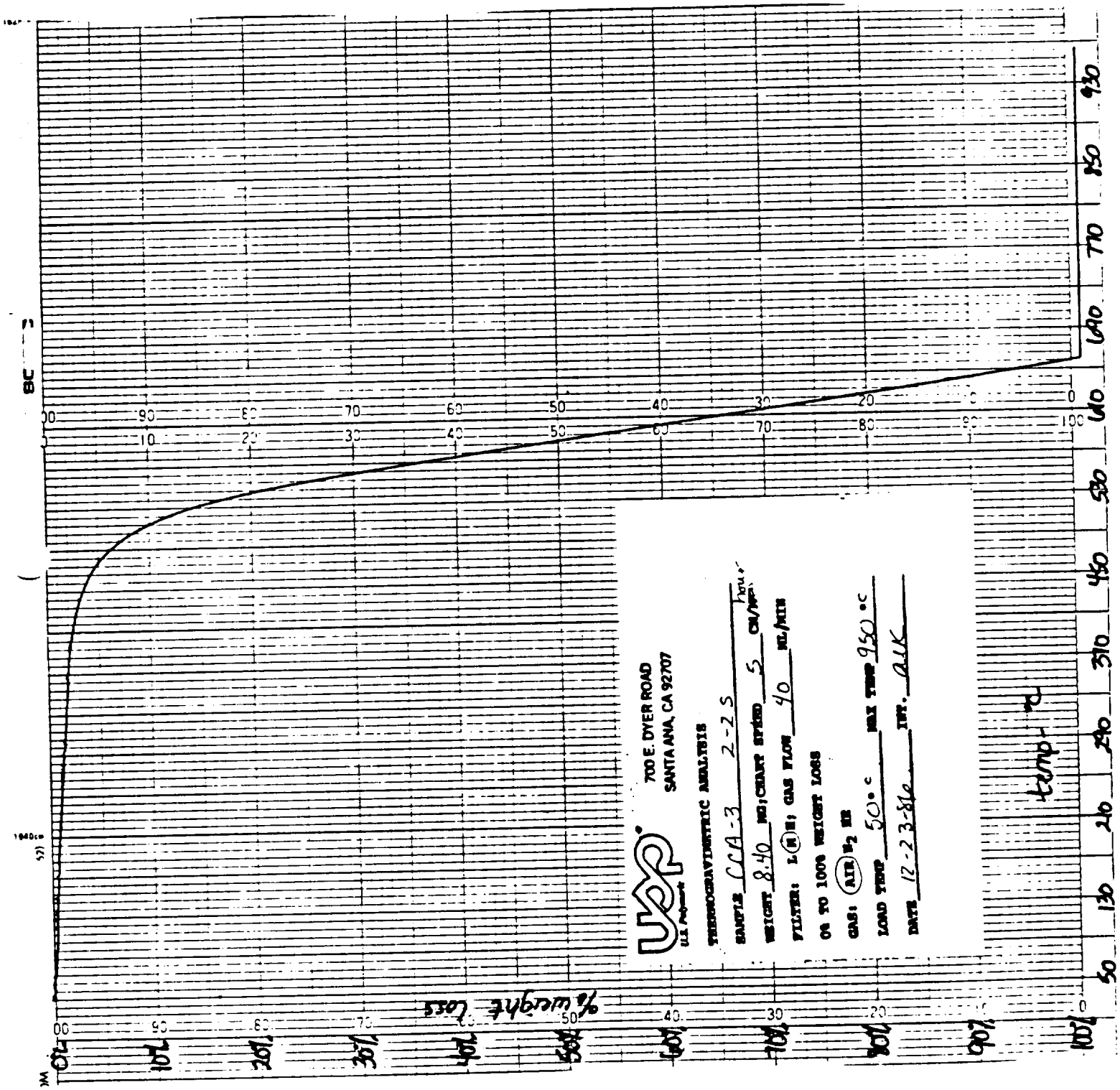

CHART 6D

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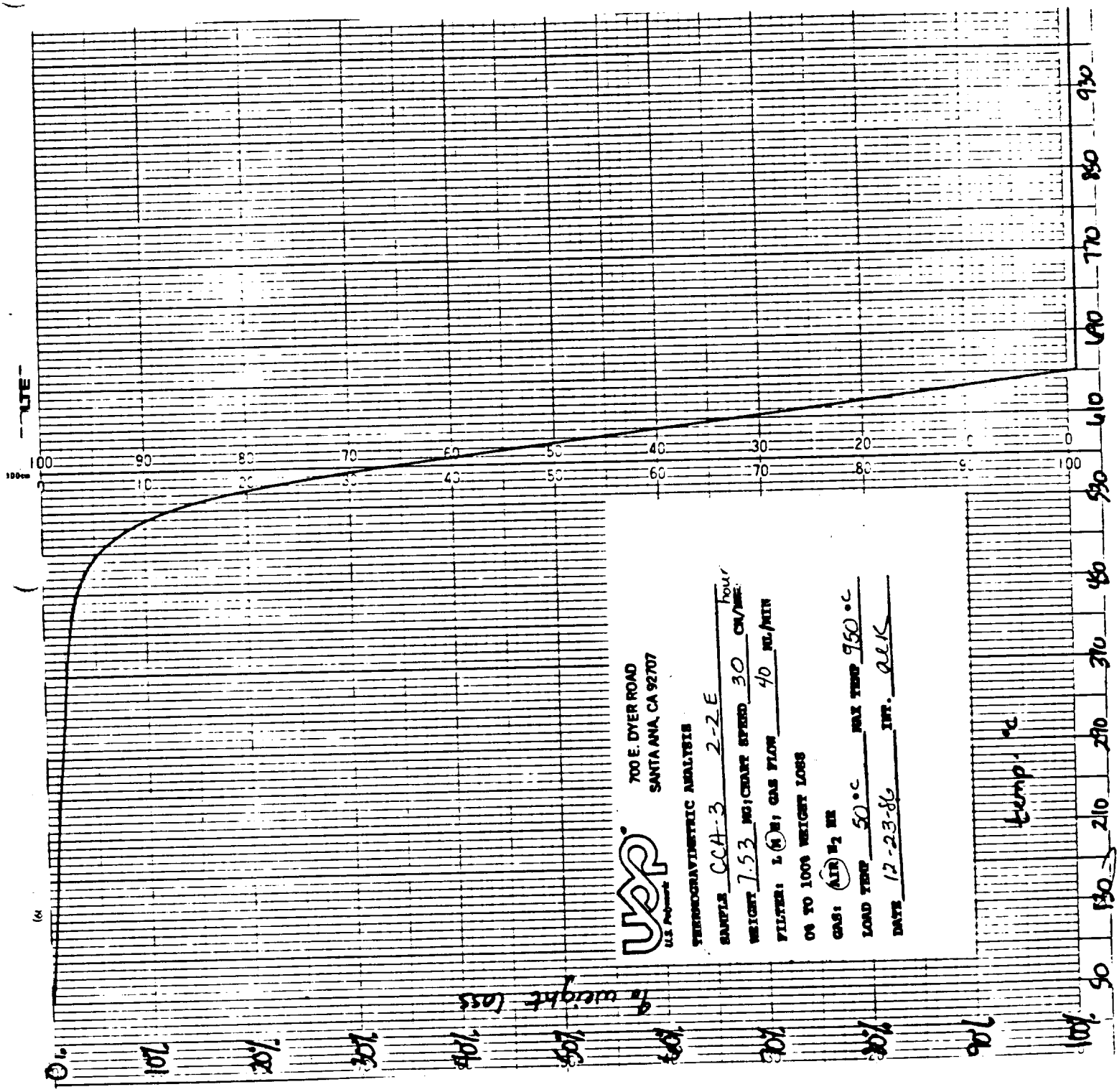

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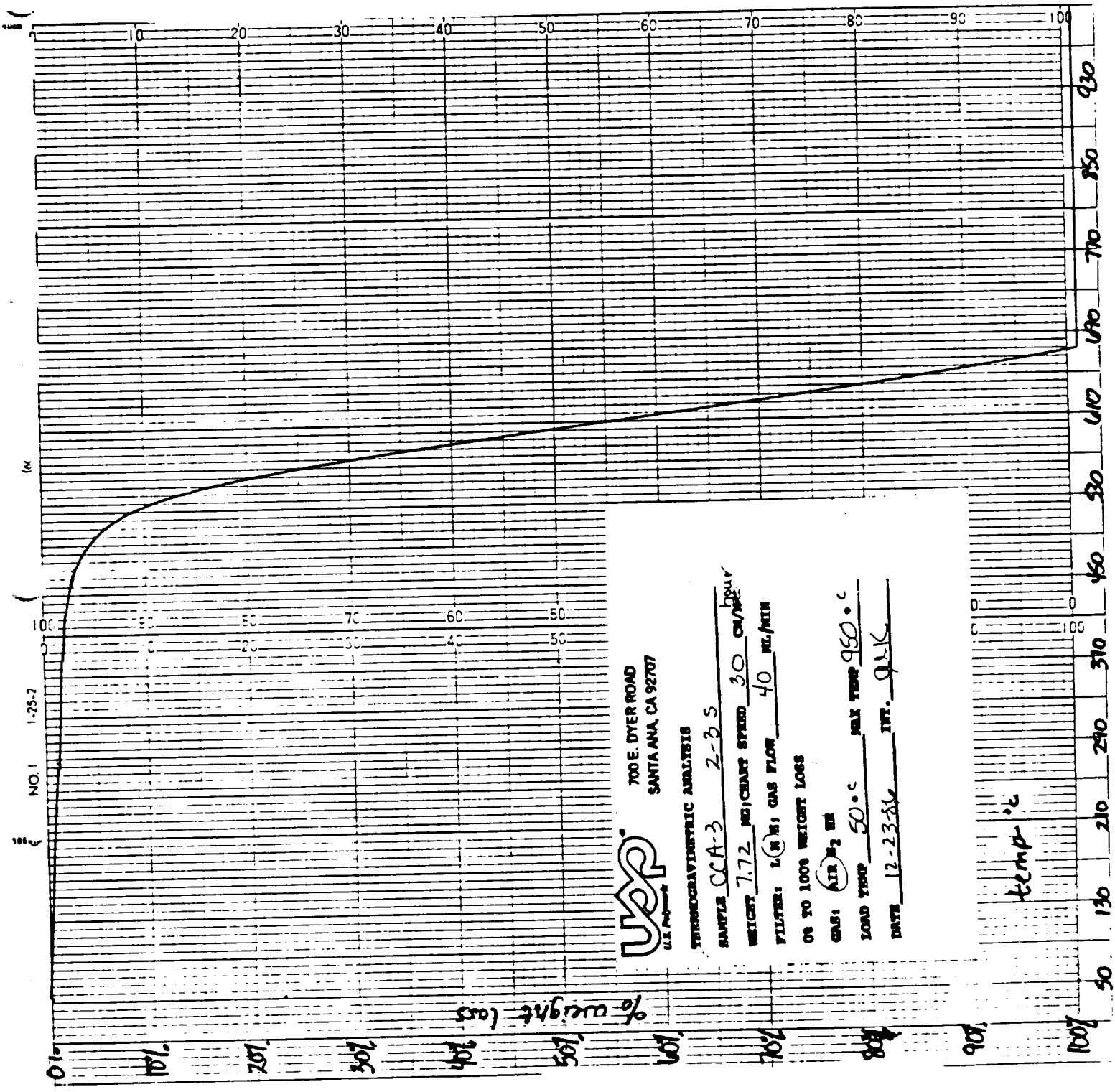

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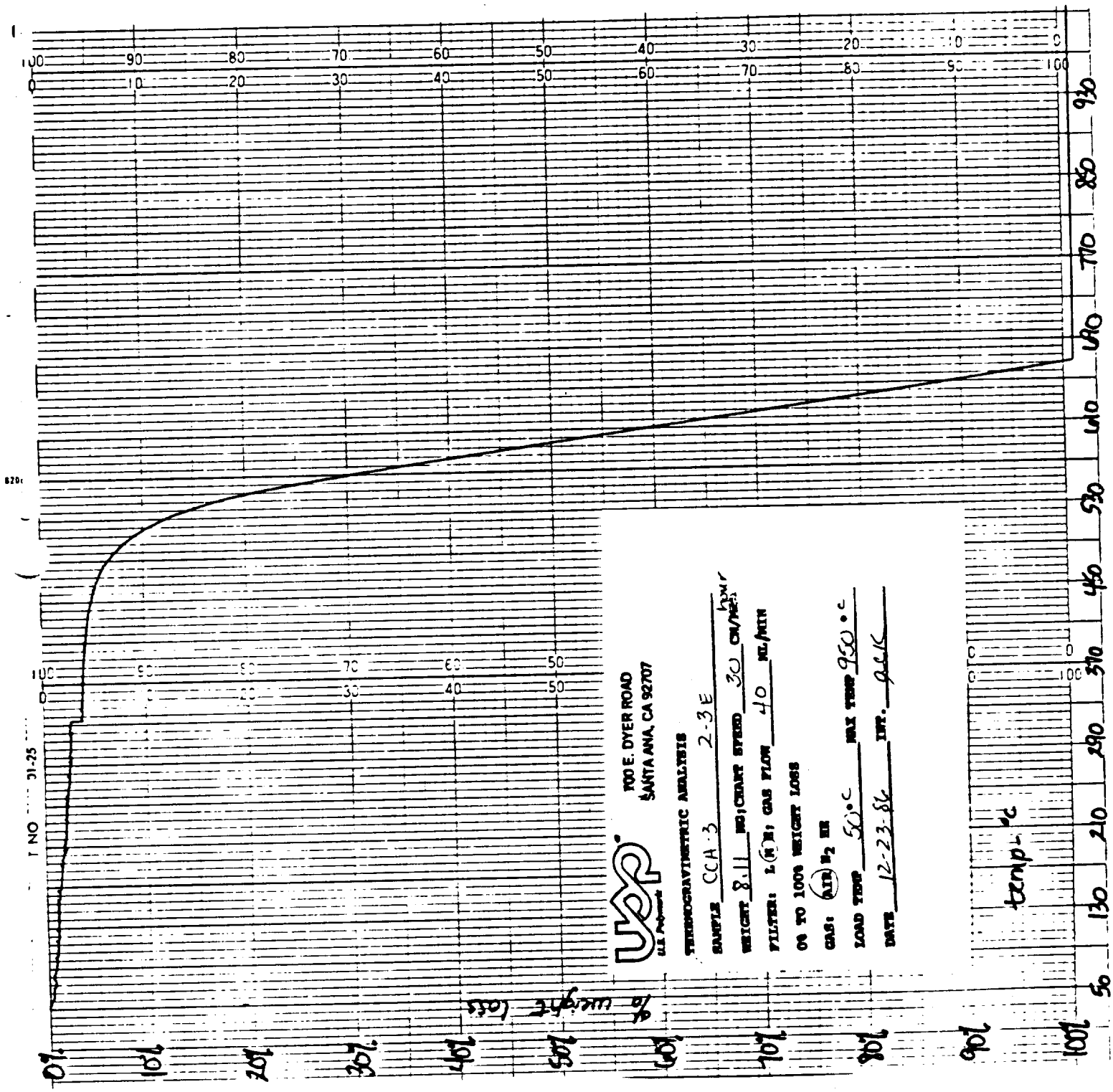

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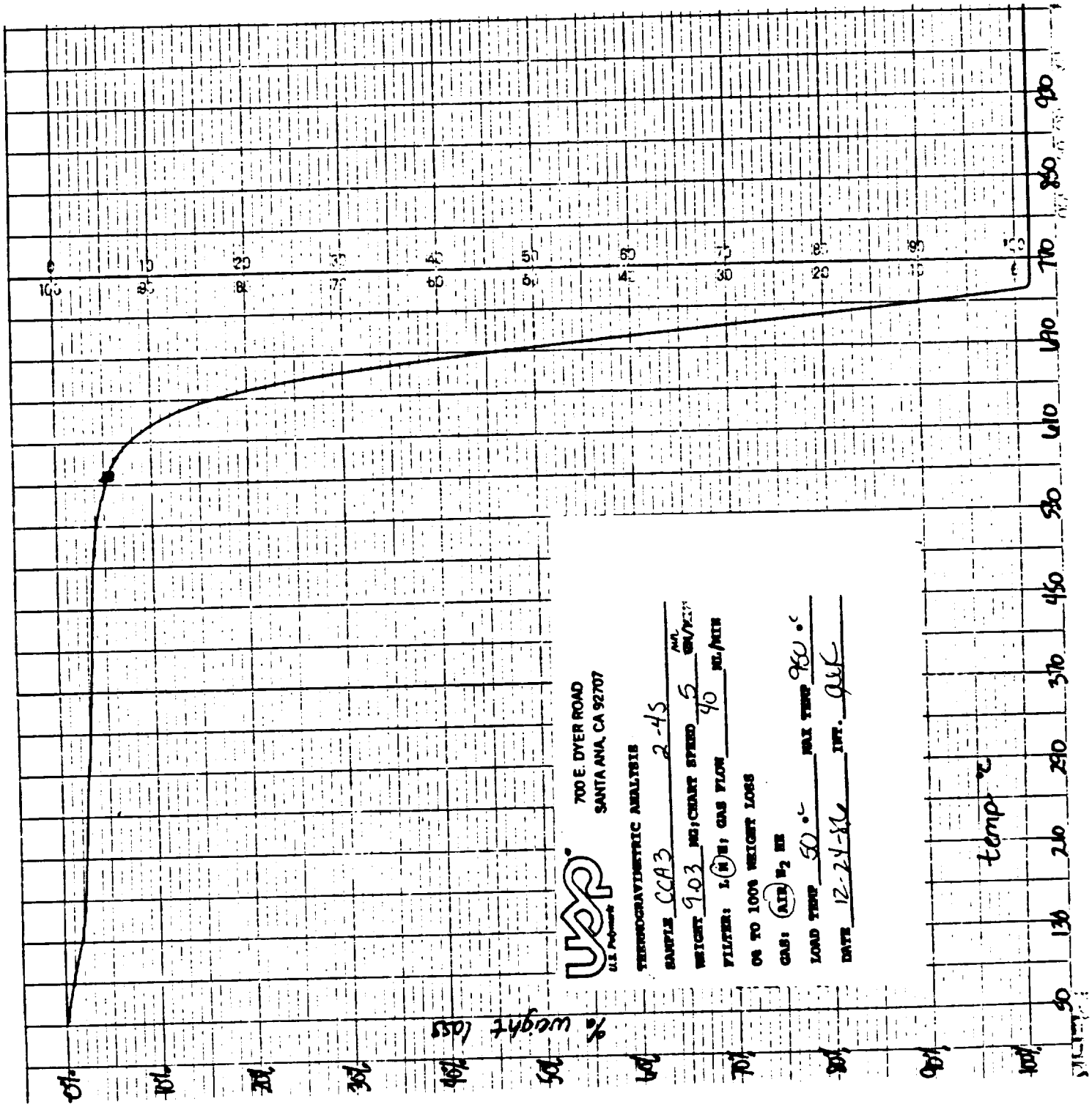

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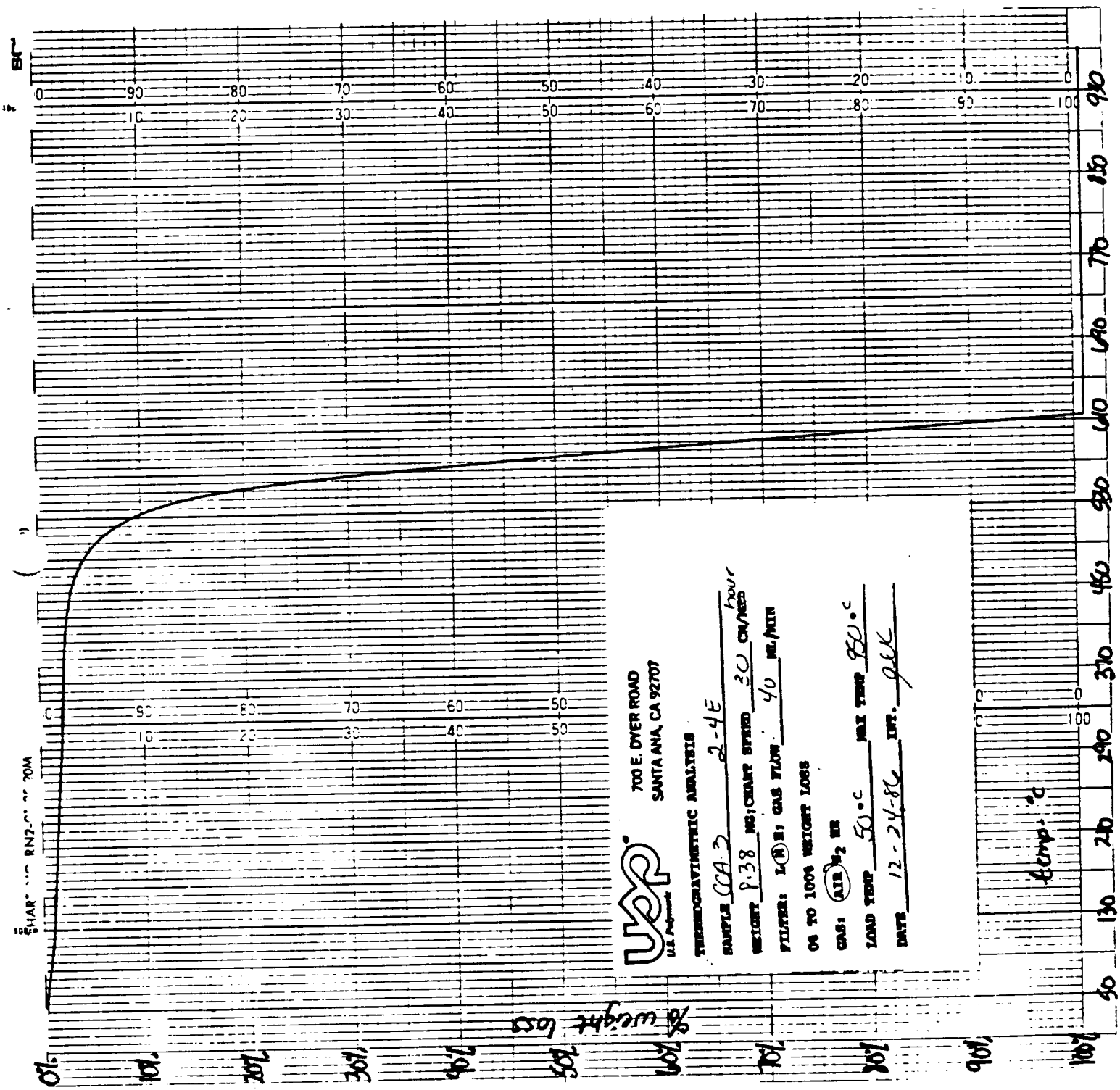

CHART 61

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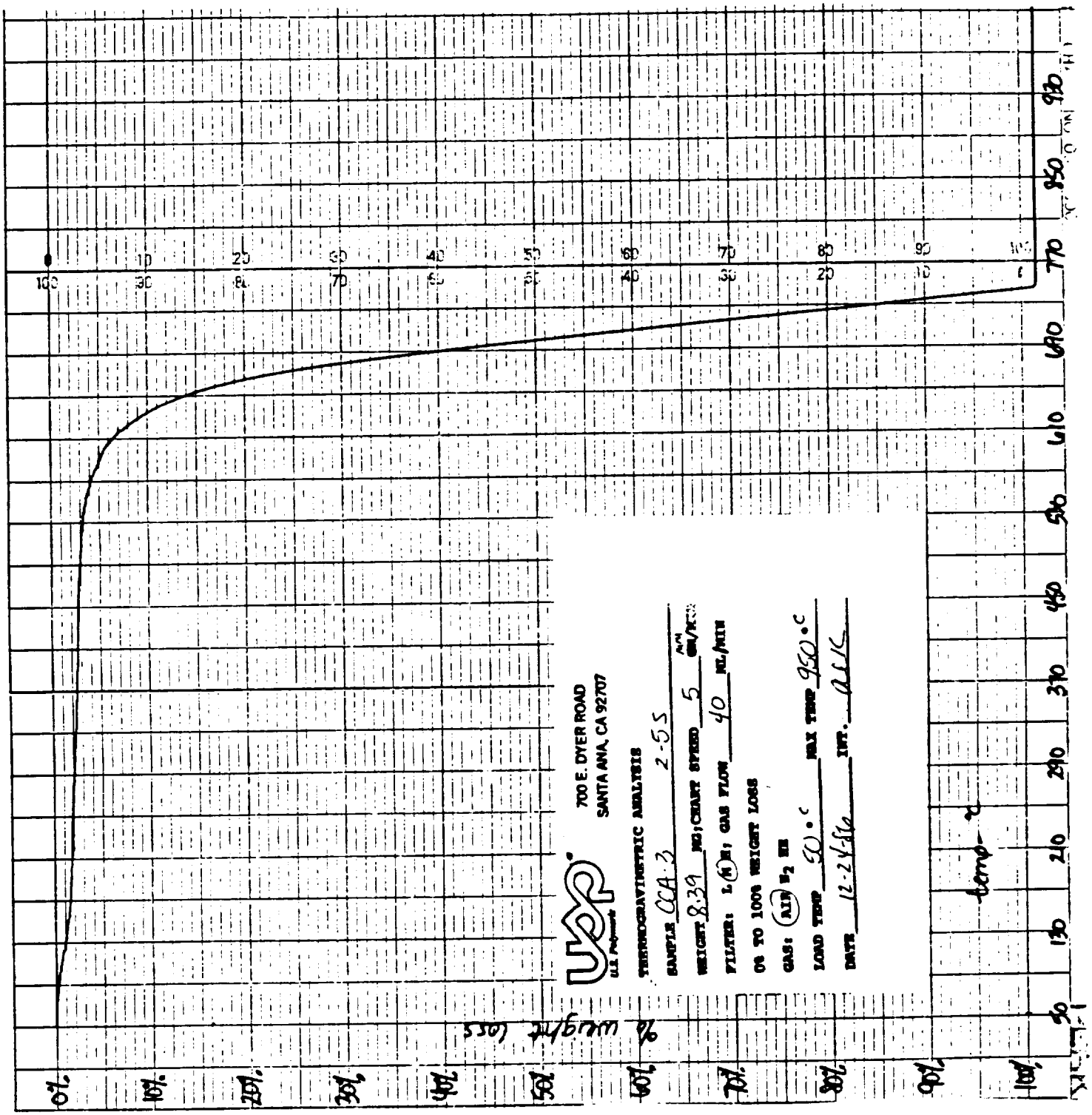

CHART 6J

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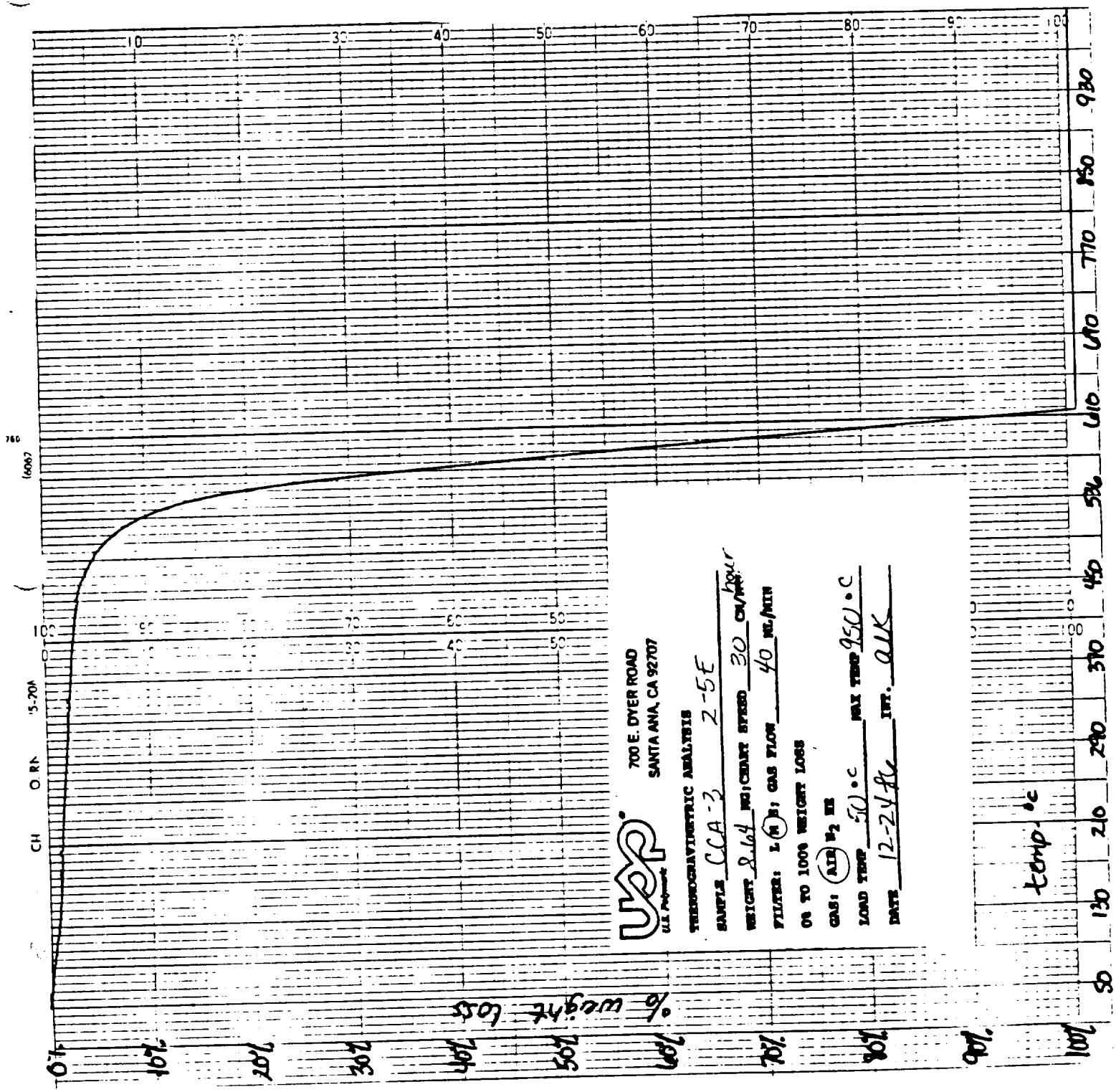

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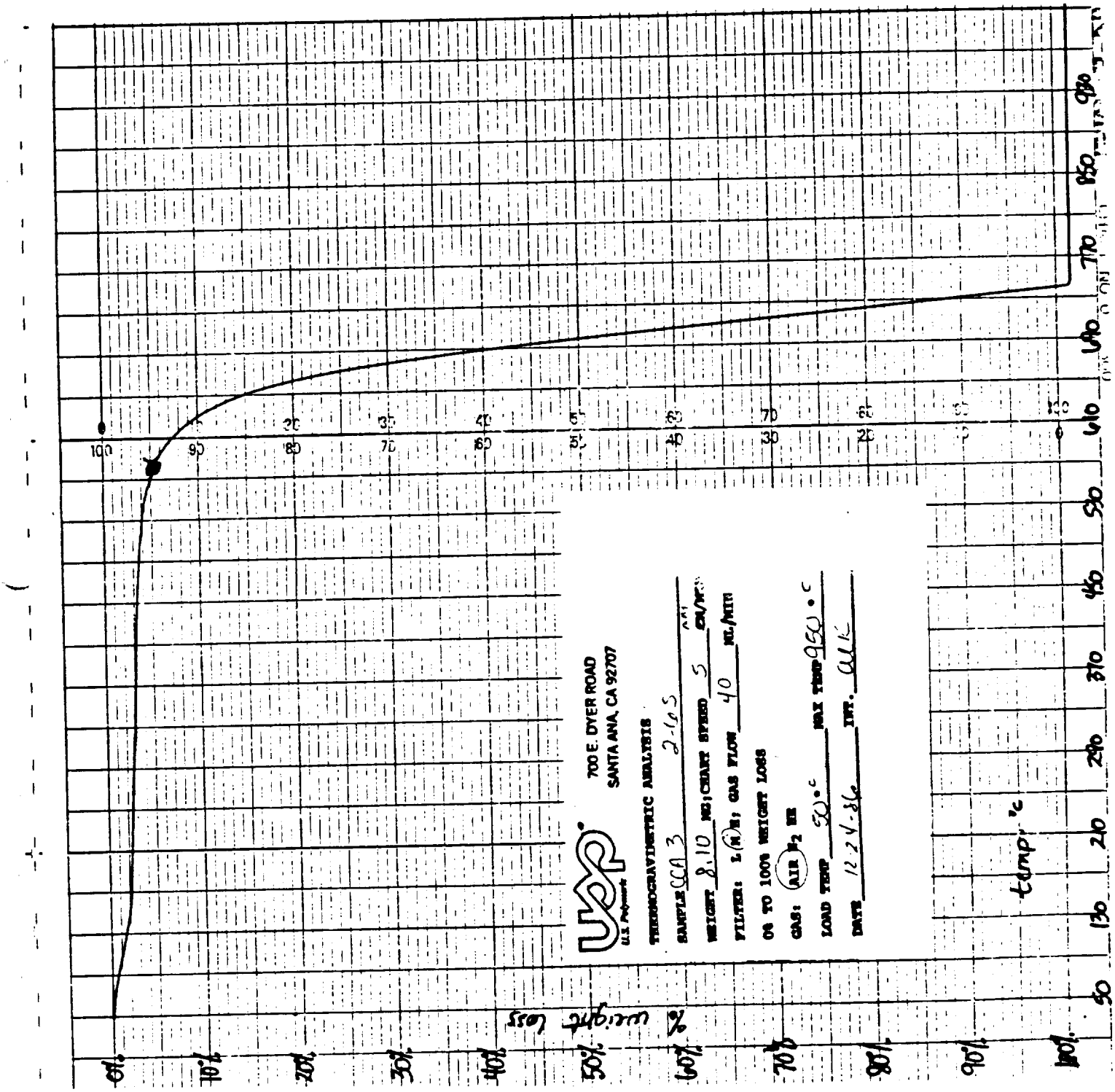

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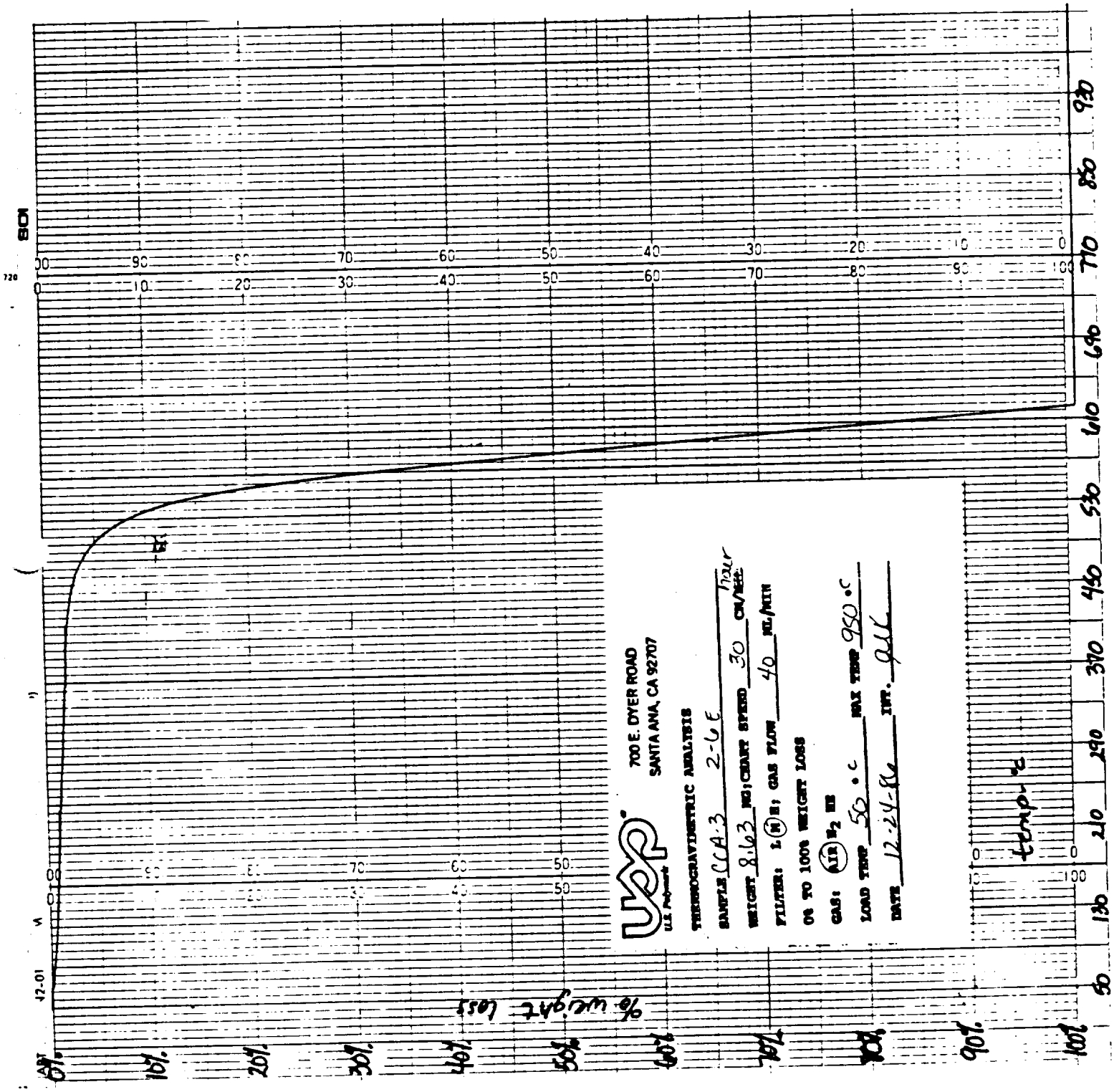

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PREPREG TESTING

NAS8-36298

U.S. Polymeric O.E. 71108

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

CHARTS

U.S. Polymeric

PREPREG TESTING

NAS8-36298

U.S. POLYMERIC O.E.71108

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

1a. Resin Content, Soxhlet, % CTM-6D

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	33.2	33.3	33.1	33.4
	32.7	32.4	31.3	34.4
	34.5	34.9	32.9	35.2
AVG.	33.5	33.5	32.4	34.3

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	33.0	34.3	33.8	34.0	33.2	34.8	33.8
	32.8	35.1	34.4	37.8	34.5	35.2	32.6
	35.7	33.7	34.3	36.2	34.0	33.6	34.9
AVG.	33.8	34.4	34.2	36.0	33.9	34.5	33.8

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	33.7	32.8	33.9	33.9	33.3	34.8	35.1
	32.5	34.0	34.3	34.3	34.1	34.7	33.8
	33.2	34.7	34.2	33.5	33.8	33.7	34.4
AVG.	33.1	33.8	34.1	33.9	33.7	34.4	34.4

NASA LOT# 2 AVERAGE 34.0

HITCO MATERIALS DIVISION
700 E. DYER ROAD, SANTA ANA, CALIFORNIA 92707 • (714) 549-1101 • TWX (910) 595-1130 • FAX # (714) 549-2858-5-2437

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

1b. Filler Content, Soxhlet, %
CTM-6D

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	13.8	13.9	13.8	13.9
	13.6	13.5	13.0	14.3
	14.4	14.5	13.7	14.7
AVG.	13.9	14.0	13.5	14.3

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	13.7	14.3	14.1	14.2	13.8	14.5	14.1
	13.7	14.6	14.3	15.7	14.4	14.7	13.6
	14.9	14.0	14.3	15.1	14.2	14.0	14.5
AVG.	14.1	14.3	14.2	15.0	14.1	14.4	14.1

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	14.0	13.7	14.1	14.1	13.9	14.5	14.6
	13.5	14.1	14.3	14.3	14.2	14.5	14.1
	13.8	14.4	14.2	13.9	14.1	14.0	14.3
AVG.	13.8	14.1	14.2	14.1	14.1	14.3	14.3

NASA LOT# 2 AVERAGE 14.2

1c. Cloth Content, Soxhlet, %
CTM-6D

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	53.0	52.8	53.1	52.7
	53.7	54.1	55.7	51.3
	51.1	50.6	53.4	50.1
AVG.	52.6	52.5	54.1	51.4

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	53.3	51.4	52.1	51.8	53.0	50.7	52.1
	53.5	50.3	51.3	46.5	51.1	50.1	53.8
	49.4	52.3	51.4	48.7	51.8	52.4	50.6
AVG.	52.1	51.3	51.6	49.0	52.0	51.1	52.2

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	52.3	53.5	52.0	52.0	52.8	50.7	50.3
	54.0	51.9	51.4	51.4	51.7	50.8	52.1
	53.0	50.9	51.6	52.6	52.1	52.3	51.3
AVG.	53.1	52.1	51.7	52.0	52.2	51.3	51.2

NASA LOT# 2 AVERAGE 51.9

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

2. Volatile Content, %
PTM-17B

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	4.4	4.0	4.3	3.8
	4.7	4.0	4.3	4.0
	4.5	4.2	4.3	4.2
AVG.	4.5	4.1	4.3	4.0

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	4.4	4.2	4.3	3.8	3.8	4.1	3.7
	4.7	4.3	4.3	3.7	3.7	4.5	4.2
	4.9	4.0	4.2	3.7	3.9	4.5	4.1
AVG.	4.7	4.2	4.3	3.7	3.8	4.4	4.0

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	3.9	4.0	4.2	4.1	4.0	4.2	4.2
	4.3	4.3	4.0	4.0	4.1	4.1	4.0
	4.0	4.4	4.4	4.4	4.5	3.9	4.4
AVG.	4.1	4.2	4.2	4.2.	4.2	4.1	4.2

NASA LOT# 2 AVERAGE 4.2

3. Flow, %
PTM-19G

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	20.0	20.3	19.9	19.3
	17.9	19.8	20.0	19.6
	19.7	20.0	20.2	19.3
AVG.	19.2	20.0	20.0	19.4

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	18.8	19.8	20.1	12.4	14.2	19.7	19.3
	19.2	19.5	19.3	14.0	12.9	19.5	19.8
	18.7	19.0	19.6	13.8	13.9	19.2	18.9
AVG.	18.9	19.4	19.7	13.4	13.7	19.5	19.3

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	19.0	15.6	17.2	16.9	17.6	17.1	16.6
	18.6	14.9	17.6	16.7	17.4	16.5	19.2
	19.4	16.0	17.7	16.1	17.5	17.0	19.6
AVG.	19.0	15.5	17.5	16.6	17.5	16.9	18.5

NASA LOT# 2 AVERAGE 18.0

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

4. Resin Content, Dry Basis, %
PTM-16F, Type II

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	34.4	33.3	34.2	35.1
	35.0	32.2	32.5	35.1
	34.5	32.5	32.5	34.4
AVG.	34.6	32.7	33.1	34.9

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	36.5	32.5	35.0	34.5	33.8	35.3	34.0
	36.4	32.9	35.3	32.4	33.4	34.7	34.4
	35.5	33.9	36.1	33.0	32.6	34.9	33.7
AVG.	36.1	33.1	35.5	33.3	33.3	35.0	34.0

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	34.6	32.9	33.6	34.1	34.7	33.9	35.4
	34.5	33.4	32.9	33.2	33.9	34.4	34.5
	33.5	33.1	32.9	33.2	34.0	34.3	34.9
AVG.	34.2	33.1	33.1	33.5	34.2	34.2	34.9

NASA LOT# 2 AVERAGE 34.0

5. TACK, lbs
PTM-80

ROLL#1-S	63	ROLL#5-E	42
ROLL#1-E	49	ROLL#6-S	30
ROLL#2-S	46	ROLL#6-E	36
ROLL#2-E	40	ROLL#7-S	49
ROLL#3-S	45	ROLL#7-E	37
ROLL#3-E	50	ROLL#8-S	36
ROLL#4-S	45	ROLL#8-E	34
ROLL#4-E	20	ROLL#9-S	29
ROLL#5-S	28	ROLL#9-E	42

NASA LOT# 2 AVERAGE 40

6. Gel Time, Seconds
PTM-20E

ROLL#1-S	118	ROLL#5-E	110
ROLL#1-E	97	ROLL#6-S	101
ROLL#2-S	98	ROLL#6-E	93
ROLL#2-E	92	ROLL#7-S	88
ROLL#3-S	90	ROLL#7-E	91
ROLL#3-E	104	ROLL#8-S	87
ROLL#4-S	94	ROLL#8-E	86
ROLL#4-E	75	ROLL#9-S	98
ROLL#5-S	81	ROLL#9-E	102

NASA LOT# 2 AVERAGE 95

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

7a. Atomic Absorption, ppm CTM-53B

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END	ROLL#3 START
Na	439	467	368	393	401
K	23	25	23	22	23
Ca	5	8	4	6	3
Mg	5	6	5	6	4
Li	0	0	0	0	0
TOTAL	472	506	400	427	431

	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START	ROLL#6 END
Na	436	417	328	346	471	473	418
K	23	19	19	19	24	25	19
Ca	8	4	7	4	4	3	5
Mg	7	6	6	5	5	5	5
Li	0	0	0	0	0	0	0
TOTAL	474	446	360	374	504	506	447

	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END	LOT#1 AVG.
Na	336	384	282	263	--	259	381
K	21	22	20	22	--	21	22
Ca	6	6	4	4	--	3	5
Mg	6	4	6	4	--	5	5
Li	0	0	0	0	--	0	0
TOTAL	369	416	312	293	--	288	413

7b. Moisture Content, % CTM-53B

ROLL#1-S	5.07	ROLL#5-E	4.73
ROLL#1-E	4.69	ROLL#6-S	4.54
ROLL#2-S	4.80	ROLL#6-E	4.93
ROLL#2-E	5.17	ROLL#7-S	4.77
ROLL#3-S	5.29	ROLL#7-E	5.00
ROLL#3-E	5.27	ROLL#8-S	4.56
ROLL#4-S	4.88	ROLL#8-E	4.66
ROLL#4-E	4.85	ROLL#9-S	----
ROLL#5-S	4.69	ROLL#9-E	4.59
		NASA LOT# 2 AVERAGE	4.85

7c. Ash Content, % CTM-53B

ROLL#1-S	.19	ROLL#5-E	.24
ROLL#1-E	.16	ROLL#6-S	.26
ROLL#2-S	.18	ROLL#6-E	.22
ROLL#2-E	.18	ROLL#7-S	.22
ROLL#3-S	.28	ROLL#7-E	.22
ROLL#3-E	.21	ROLL#8-S	.20
ROLL#4-S	.20	ROLL#8-E	.18
ROLL#4-E	.19	ROLL#9-S	--
ROLL#5-S	.14	ROLL#9-E	.19
		NASA LOT# 2 AVERAGE	.20

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

8. TGA, % weight loss at 500°C
CTM-51 (Nitrogen)

ROLL#1-S	10.0	ROLL#5-E	9.6
ROLL#1-E	9.8	ROLL#6-S	8.9
ROLL#2-S	10.0	ROLL#6-E	9.4
ROLL#2-E	9.5	ROLL#7-S	9.3
ROLL#3-S	10.1	ROLL#7-E	9.6
ROLL#3-E	9.7	ROLL#8-S	9.1
ROLL#4-S	9.3	ROLL#8-E	8.8
ROLL#4-E	9.4	ROLL#9-S	--
ROLL#5-S	8.2	ROLL#9-E	8.3
		NASA LOT# 2 AVERAGE	9.4

See chart 8A-8Q

9. DSC, °C
CTM-50A

	FIRST TEMPERATURE	SECOND TEMPERATURE
ROLL#1-S	176	242
ROLL#1-E	176	242
ROLL#2-S	178	241
ROLL#2-E	178	242
ROLL#3-S	179	244
ROLL#3-E	177	242
ROLL#4-S	178	241
ROLL#4-E	177	242
ROLL#5-S	178	240
ROLL#5-E	180	242
ROLL#6-S	179	244
ROLL#6-E	178	240
ROLL#7-S	176	242
ROLL#7-E	178	241
ROLL#8-S	176	242
ROLL#8-E	176	243
ROLL#9-S	---	---
ROLL#9-E	176	242
NASA LOT# 2 AVERAGE	177	242

See chart 9A-9Q

10. Infrared (IRZB) Baseline
CTM-21C

ROLL#1-S	1.11	ROLL#5-E	1.08
ROLL#1-E	1.11	ROLL#6-S	1.09
ROLL#2-S	1.08	ROLL#6-E	1.10
ROLL#2-E	1.10	ROLL#7-S	1.11
ROLL#3-S	1.07	ROLL#7-E	1.09
ROLL#3-E	1.10	ROLL#8-S	1.11
ROLL#4-S	1.10	ROLL#8-E	1.08
ROLL#4-E	1.10	ROLL#9-S	1.09
ROLL#5-S	1.18	ROLL#9-E	1.11
		NASA LOT# 2 AVERAGE	1.10

See chart 10A-10Q

11. Environmental History

Date manufactured: 27-28, May 1986
Package in: Polyethylene bag supported in cardboard carton
Date shipped: 8, July 1986 in 40°F truck

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

12. Specific Gravity, Cured, Units
ASTM D792

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	1.485	1.467	1.477	1.479
	1.486	1.433	1.467	1.473
	1.485	1.469	1.443	1.464
AVG.	1.485	1.456	1.462	1.472

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	1.486	1.480	1.484	1.469	1.482	1.473	1.480
	1.488	1.486	1.486	1.476	1.477	1.474	1.483
	1.488	1.476	1.479	1.472	1.481	1.463	1.483
AVG.	1.487	1.481	1.483	1.472	1.480	1.470	1.482

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	1.485	1.481	1.478	1.481	1.478	--	1.481
	1.477	1.483	1.470	1.471	1.481	--	1.479
	1.466	1.479	1.476	1.485	1.473	--	1.479
AVG.	1.476	1.481	1.475	1.479	1.477	--	1.480

NASA LOT# 2 AVERAGE 1.476

13a. Tensile Strength, ksi, WARP
FTMS 406-1011

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	19.62	19.26	19.46	19.39
	19.73	19.52	20.52	18.80
	18.68	19.59	18.80	19.45
	18.26	19.75	18.91	17.66
	18.07	20.04	20.85	20.08
AVG.	18.87	19.63	19.71	19.08

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	16.62	17.32	18.73	19.50	16.87	20.95	19.52
	16.55	19.17	19.94	19.30	16.69	20.10	19.32
	18.38	17.95	19.20	18.93	17.27	12.78	18.19
	16.44	20.00	20.37	18.24	17.19	19.35	18.52
	18.20	17.77	19.23	19.21	15.83	19.77	18.13
AVG.	17.24	18.44	19.49	19.04	16.77	18.59	18.74

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	17.53	19.87	20.88	21.20	20.06	--	19.62
	18.08	20.79	20.34	22.74	19.80	--	18.76
	13.28	21.33	20.15	20.25	20.03	--	20.39
	16.82	22.44	20.21	19.94	17.40	--	19.66
	17.65	22.21	20.81	20.69	18.45	--	20.29
AVG.	16.67	21.33	20.48	20.96	19.15	--	19.74

NASA LOT# 2 AVERAGE 19.05

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

13b. Tensile Modulus, msi, WARP
FTMS 406-1011

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	3.11	3.12	3.52	3.15
	3.11	3.26	3.15	3.10
	3.02	2.99	3.09	3.05
	2.94	3.26	3.11	2.91
	3.29	3.13	3.46	2.99
AVG.	3.09	3.15	3.27	3.04

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	3.15	3.20	3.28	3.93	2.80	3.18	2.99
	2.70	3.07	3.00	3.16	2.96	3.37	3.00
	2.93	3.01	3.18	3.16	2.96	3.14	2.76
	2.80	3.11	3.25	3.09	2.90	3.10	2.98
	3.03	3.41	3.09	3.10	3.06	3.03	2.90
AVG.	2.92	3.16	3.16	3.29	2.94	3.16	2.93

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	3.05	2.97	3.13	2.99	3.04	--	2.95
	2.99	2.90	3.02	3.15	3.06	--	2.97
	2.73	3.00	2.98	2.99	2.96	--	2.98
	2.86	3.04	3.05	3.00	3.05	--	2.85
	2.91	2.90	2.93	2.94	2.91	--	2.97
AVG.	2.91	2.96	3.02	3.01	3.00	--	2.94

NASA LOT# 2 AVERAGE 3.06

13c. Tensile Elongation, %, WARP
FTMS 406-1011

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	.97	.97	.89	.94
	.97	.88	1.02	.98
	.92	.95	.91	.99
	.88	.92	.79	.90
	.82	1.00	.82	.98
AVG.	.91	.94	.89	.96

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	.80	.75	.79	.94	1.06	1.11	1.07
	.78	.90	.90	1.00	.90	1.07	--
	.94	.86	.95	1.05	.88	.77	1.02
	.82	.94	.88	.98	1.00	.96	.98
	.87	.80	.88	1.03	.82	1.04	.97
AVG.	.84	.85	.88	1.00	.93	.99	1.01

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

13c. Tensile Elongation, %, WARP (CONTINUED)
FTMS 406-1011

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	.87	1.05	1.00	1.09	.92	--	1.01
	.96	1.10	1.06	1.19	.99	--	.96
	--	1.09	1.05	1.07	1.02	--	1.06
	.91	1.09	1.01	1.04	.80	--	1.04
	.98	1.21	1.05	1.05	.94	--	1.03
AVG.	.93	1.11	1.03	1.09	.93	--	1.02

NASA LOT# 2 AVERAGE .96

14a. Flexural Strength, ksi, WARP
FTMS 406-1031

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	32.88	32.00	36.06	31.25
	29.41	30.95	32.60	30.47
	28.70	37.76	31.30	30.93
	29.43	34.57	34.61	36.62
	28.47	34.79	34.92	30.54
AVG.	29.78	34.01	33.90	31.96

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	29.97	31.49	32.48	30.53	30.96	32.80	29.38
	26.24	29.34	32.84	30.98	28.67	31.03	30.28
	30.41	31.27	33.14	30.18	30.46	31.91	29.09
	31.53	32.61	33.74	29.39	29.61	31.94	28.20
	29.14	31.21	32.45	28.80	27.66	35.28	28.36
AVG.	29.46	31.18	32.93	29.98	29.47	32.59	29.06

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	31.30	36.75	34.57	33.80	33.28	--	31.90
	30.58	34.57	32.23	32.50	34.41	--	32.72
	31.13	31.84	31.58	34.68	35.66	--	29.08
	29.68	35.40	31.99	33.19	35.67	--	33.72
	29.69	38.19	31.63	37.29	35.89	--	33.38
AVG.	30.48	35.35	32.40	34.29	34.92	--	32.16

NASA LOT# 2 AVERAGE 32.00

14b. Flexural Modulus, msi, WARP
FTMS 406-1031

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	2.77	2.48	2.83	3.05
	2.69	2.50	2.76	3.04
	2.63	2.68	2.83	2.96
	2.85	2.60	2.72	3.01
	2.85	2.65	2.94	2.85
AVG.	2.76	2.58	2.82	2.98

FM 5055B NASA LOT# 2 U.S.P. LOT# D09256

14b. Flexural Modulus, msi, WARP (CONTINUED)
FTMS 406-1031

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	2.88	2.63	2.87	2.80	2.79	2.75	2.64
	2.86	2.64	2.90	2.81	2.76	2.74	2.56
	2.71	2.70	2.86	2.89	2.73	2.74	2.71
	2.87	2.72	2.79	2.89	2.60	2.66	2.63
	2.98	2.76	2.69	2.79	2.72	2.81	2.61
AVG.	2.86	2.69	2.82	2.83	2.72	2.74	2.63

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	2.75	2.98	3.16	2.93	3.06	--	2.88
	2.75	2.87	2.94	2.98	2.66	--	3.09
	2.74	2.91	2.86	2.93	3.07	--	2.96
	2.69	2.99	2.80	2.98	3.19	--	3.01
	2.48	3.10	3.14	2.93	3.00	--	2.89
AVG.	2.68	2.97	2.98	2.95	3.00	--	2.97

NASA LOT# 2 AVERAGE 2.82

15a. Compressive Strength, ksi, WARP
FTMS 406-1021

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	56.78	56.14	61.91	51.27
	54.64	56.96	54.49	57.02
	58.75	61.48	58.08	51.72
	53.06	60.78	58.81	55.79
	52.77	55.50	59.39	53.89
AVG.	55.20	58.17	58.54	53.94

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	57.90	62.41	49.73	51.57	37.91	59.33	46.33
	60.65	61.18	47.78	47.03	43.12	52.61	51.42
	69.32	59.71	52.98	55.08	49.76	60.42	51.92
	54.95	58.97	47.19	59.71	38.55	51.23	49.95
	53.17	58.44	46.05	55.88	44.01	66.58	51.87
AVG.	59.20	60.14	48.75	53.85	42.67	58.03	50.30

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	54.80	53.96	52.46	58.10	58.96	--	48.57
	57.35	58.90	56.51	54.02	50.09	--	55.16
	54.43	52.66	64.14	58.80	62.37	--	57.02
	52.88	64.29	57.64	50.59	54.81	--	59.58
	50.24	55.04	59.26	59.52	49.88	--	57.34
AVG.	53.94	56.97	58.00	56.21	55.22	--	55.53

NASA LOT# 2 AVERAGE 54.98

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

15b. Compressive, Modulus, msi, WARP
FTMS 406-1021

ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
3.18	3.06	2.82	2.72
3.10	3.01	2.87	2.65
2.90	3.10	2.76	2.81
3.10	2.93	2.58	3.03
3.07	2.94	2.81	2.79
AVG. 3.07	3.01	2.77	2.80

ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
3.21	2.99	2.95	2.67	2.92	2.80	3.00
3.19	3.01	2.87	2.81	2.80	2.69	2.61
3.47	2.84	2.79	2.71	2.82	2.78	2.94
3.21	3.16	2.84	2.76	2.87	2.74	2.91
3.11	3.31	2.86	2.73	2.89	2.70	2.79
AVG. 3.24	3.06	2.86	2.73	2.86	2.74	2.85

ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
2.75	2.97	3.07	3.03	3.06	--	3.10
2.75	3.00	2.99	2.97	3.10	--	3.00
2.76	3.06	3.05	2.98	2.96	--	3.18
2.60	3.13	3.03	2.96	3.14	--	3.02
2.69	3.11	2.97	2.89	3.05	--	3.01
AVG. 2.71	3.05	3.02	2.97	3.06	--	3.06

NASA LOT# 2 AVERAGE 2.93

16. Double Shear Strength, ksi
FTMS 406-1041A

ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
3.20	4.78	4.24	4.73
5.33	4.05	4.43	4.12
2.88	4.52	4.66	4.37
4.01	3.95	4.69	3.78
3.88	5.08	3.22	3.81
AVG. 3.86	4.47	4.25	4.16

ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
4.32	3.64	3.28	4.68	3.25	4.65	4.68
3.83	4.43	3.17	4.19	4.27	4.66	4.17
4.91	3.27	3.01	5.18	5.36	4.44	5.27
4.24	4.73	2.94	4.04	4.65	3.63	4.96
5.07	4.38	4.39	4.71	4.11	5.29	4.39
AVG. 4.48	4.09	3.36	4.56	4.33	4.53	4.69

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

16. Double Shear Strength, ksi (CONTINUED)
FTMS 406-1041A

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	3.93	4.71	5.67	4.68	5.45	--	4.83
	3.93	5.30	5.30	4.23	5.92	--	4.26
	3.76	5.78	3.84	5.01	5.25	--	5.88
	3.28	5.40	5.53	5.20	5.34	--	5.10
	4.46	6.33	5.32	5.24	5.41	--	4.85
AVG.	3.87	5.50	5.13	4.87	5.48	--	4.98

NASA LOT# 2 AVERAGE 4.51

17. Barcol Hardness, Units
ASTM D-2583
(Average of 10 determinations)

ROLL#1-S	71.8	ROLL#5-E	72.2
ROLL#1-E	72.3	ROLL#6-S	70.7
ROLL#2-S	71.8	ROLL#6-E	71.6
ROLL#2-E	73.4	ROLL#7-S	73.2
ROLL#3-S	71.9	ROLL#7-E	72.5
ROLL#3-E	71.2	ROLL#8-S	73.0
ROLL#4-S	72.0	ROLL#8-E	73.6
ROLL#4-E	72.3	ROLL#9-S	--
ROLL#5-S	72.1	ROLL#9-E	72.4

NASA LOT# 2 AVERAGE 72.2

18. Residual Volatiles, %
PTM-98

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	2.25	2.38	2.04	2.36
	2.23	2.35	2.03	2.31
	2.15	2.20	1.96	2.28
AVG.	2.21	2.31	2.01	2.32

	ROLL#3 END	ROLL#3 START	ROLL#4 END	ROLL#4 START	ROLL#5 END	ROLL#5 START	ROLL#6 END
	1.87	2.46	2.54	2.44	1.47	1.45	1.60
	1.70	2.53	2.58	2.38	1.51	1.56	1.54
	1.80	2.37	2.57	2.41	1.48	1.54	1.48
AVG.	1.79	2.45	2.56	2.41	1.49	1.52	1.54

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	2.19	1.65	1.67	1.16	1.76	--	1.80
	2.18	1.66	1.74	1.18	1.79	--	1.82
	2.16	1.66	1.70	1.19	1.75	--	1.81
AVG.	2.18	1.66	1.70	1.18	1.77	--	1.81

NASA LOT# 2 AVERAGE 1.93

19. Resin Content, Pyrolysis, %
CTM-14

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	35.64	35.66	35.33	35.04
	36.52	36.36	34.70	33.78
	36.34	35.55	35.73	35.00
AVG.	36.17	35.86	35.25	34.61

FM 5055B NASA LOT# 2 U.S.P. LOT# D09256

19. Resin Content, Pyrolysis, % (CONTINUED)
CTM-14B

	ROLL#3 END	ROLL#3 START	ROLL#4 END	ROLL#4 START	ROLL#5 END	ROLL#5 START	ROLL#6 END
	35.11	34.82	32.58	34.41	35.36	32.89	34.61
	35.09	35.68	32.08	34.83	34.17	35.00	34.09
	35.83	35.44	32.75	34.32	37.39	34.12	33.61
AVG.	35.34	35.31	32.47	34.52	35.64	34.00	34.10

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	34.63	35.42	37.95	35.67	38.11	--	37.08
	34.71	33.54	36.31	36.13	38.47	--	37.06
	33.65	32.73	37.43	34.72	38.84	--	36.04
AVG.	34.33	33.90	37.24	35.50	38.47	--	36.73

NASA LOT# 2 AVERAGE 35.26

20. Acetone Extraction, %
CTM-18A

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	.42	.17	.50	.46
	.09	.23	.40	.33
	.34	.34	.49	.59
AVG.	.28	.25	.13	.46

	ROLL#3 END	ROLL#3 START	ROLL#4 END	ROLL#4 START	ROLL#5 END	ROLL#5 START	ROLL#6 END
	.27	-.39	.23	-.08	-.47	-.52	.16
	-1.20	.08	.16	-.09	.00	.17	.22
	.23	.15	-.08	-1.06	.21	-.70	.14
AVG.	-.24	-.05	.10	-.41	-.09	-.35	.17

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	.08	.16	.36	.59	-.16	--	.08
	-.15	.24	.28	-.14	.00	--	-.81
	.34	.15	.31	.98	.08	--	-.42
AVG.	.09	.18	.32	.47	-.03	--	-.38

NASA LOT # 2 AVERAGE .05

21a. CTE, in/in °F, with PLY
PTM-61B

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	5.28	6.06	4.21	4.87
	5.45	4.82	5.55	6.96
AVG.	5.37	5.44	4.88	5.92

	ROLL#3 END	ROLL#3 START	ROLL#4 END	ROLL#4 START	ROLL#5 END	ROLL#5 START	ROLL#6 END
	4.54	3.49	5.05	4.63	3.51	4.27	9.79
	5.28	2.49	5.19	3.58	4.43	5.17	5.36
AVG.	4.91	2.99	5.12	4.11	3.97	4.72	7.58

FM 5055B NASA LOT# 2 U.S.P. LOT# D09274

21a. CTE, in/in °F, with PLY (CONTINUED)
PTM-61B

	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	5.90	4.87	4.99	5.38	4.26	--	6.13
	5.05	4.22	3.56	4.73	5.24	--	7.29
AVG.	5.48	4.55	4.28	5.06	4.75	--	6.71

NASA LOT#2 AVERAGE 5.05

21b. CTE, in/in °F, Crossply
PTM-61B

	ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
	6.84	9.58	6.83	11.34
	6.16	11.27	10.72	7.27
AVG.	6.50	10.43	8.78	9.31

	ROLL#3 END	ROLL#3 START	ROLL#4 END	ROLL#4 START	ROLL#5 END	ROLL#5 START	ROLL#6 END
	9.83	7.77	7.37	6.21	8.07	10.01	6.36
	10.52	7.40	9.99	7.08	6.41	6.92	6.48
AVG.	10.18	7.59	8.68	6.65	7.24	8.47	6.42

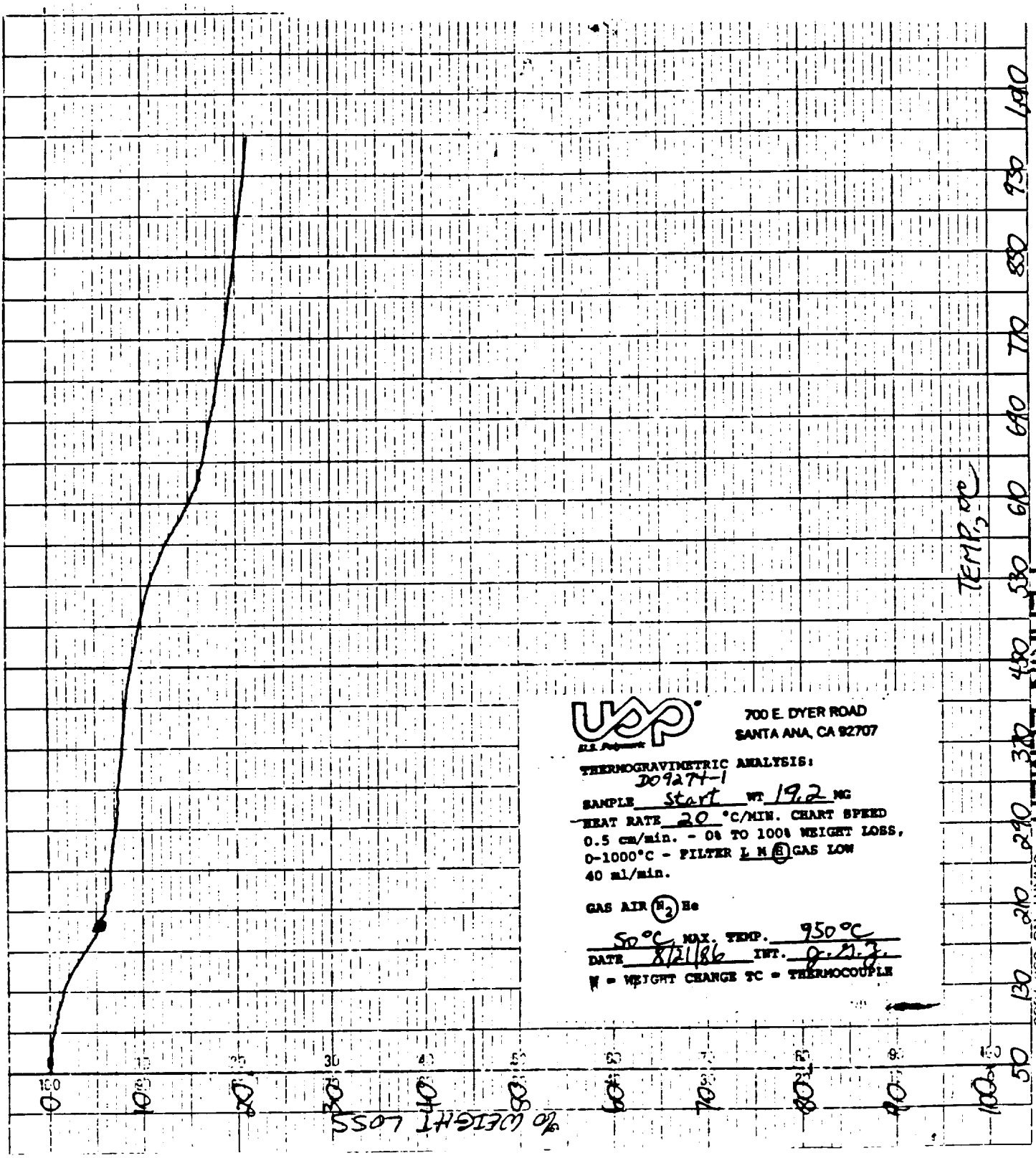
	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	9.78	7.72	9.85	6.97	8.15	--	10.15
	7.40	8.51	7.82	5.78	6.97	--	7.09
AVG.	8.59	8.12	8.84	6.38	7.56	--	8.62

NASA LOT# 2 AVERAGE 8.14

See chart 21A-21Q

U.S. Polymeric

Hamid M. Quraishi, Manager
Quality Assurance Department



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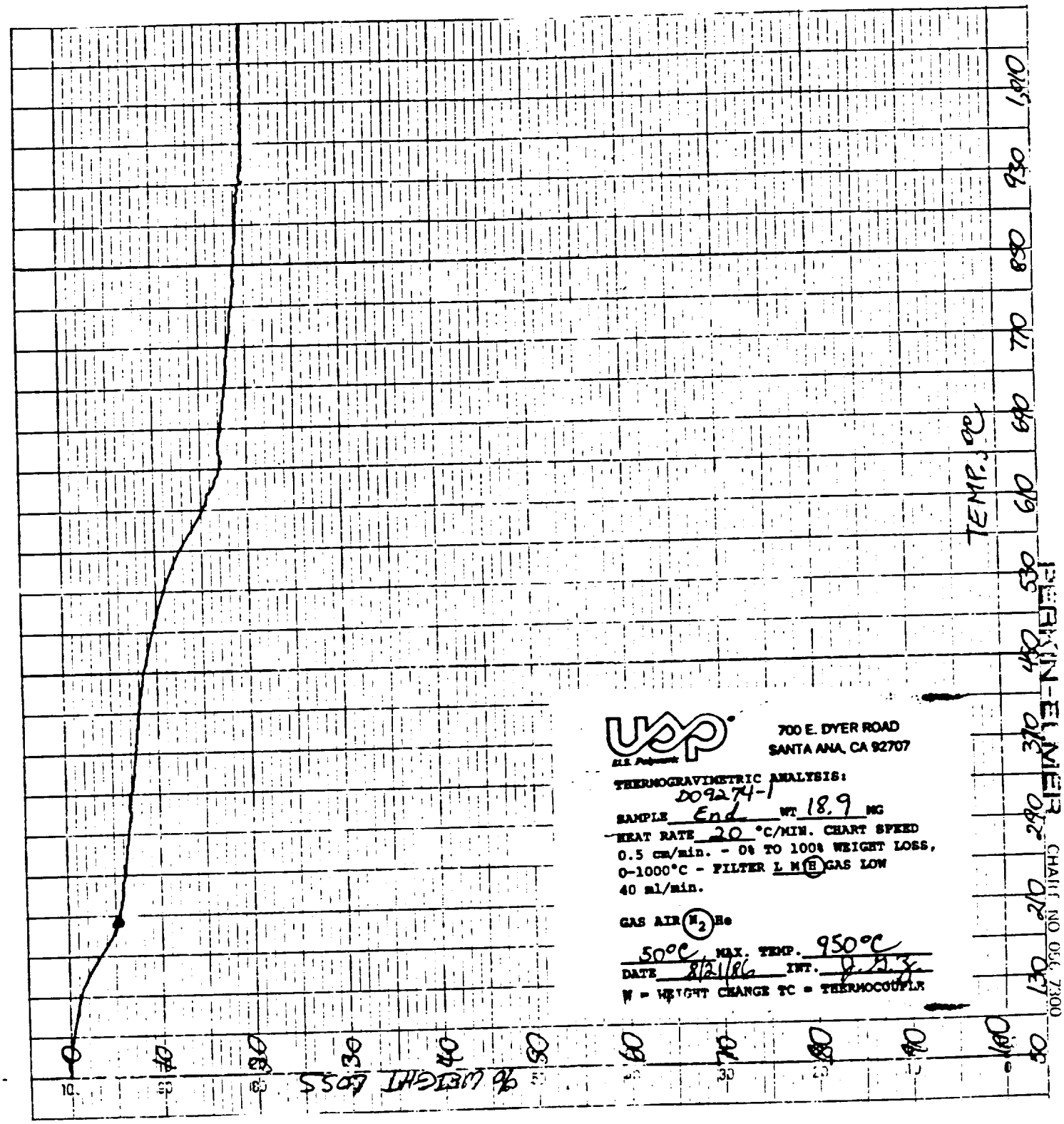

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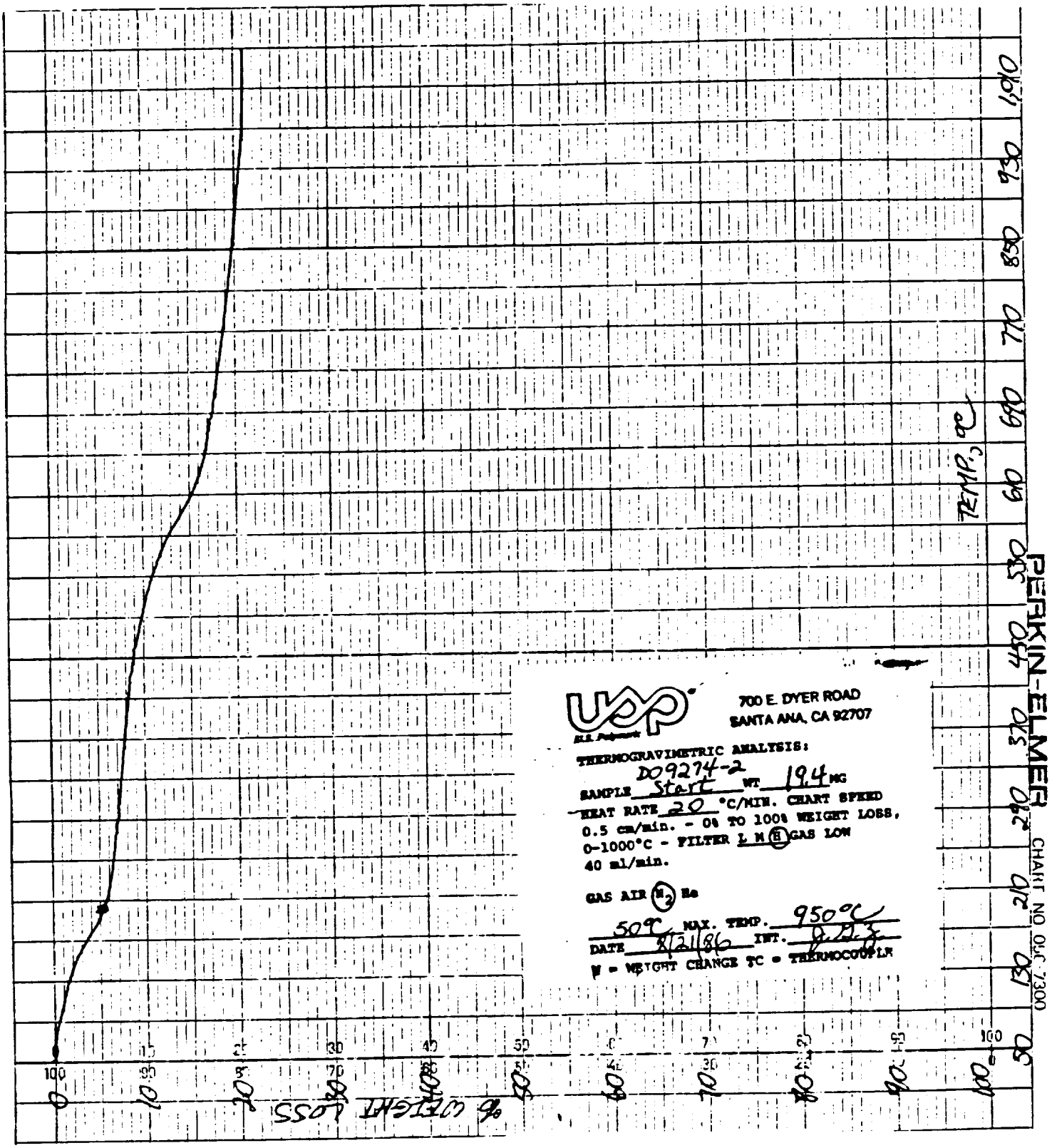

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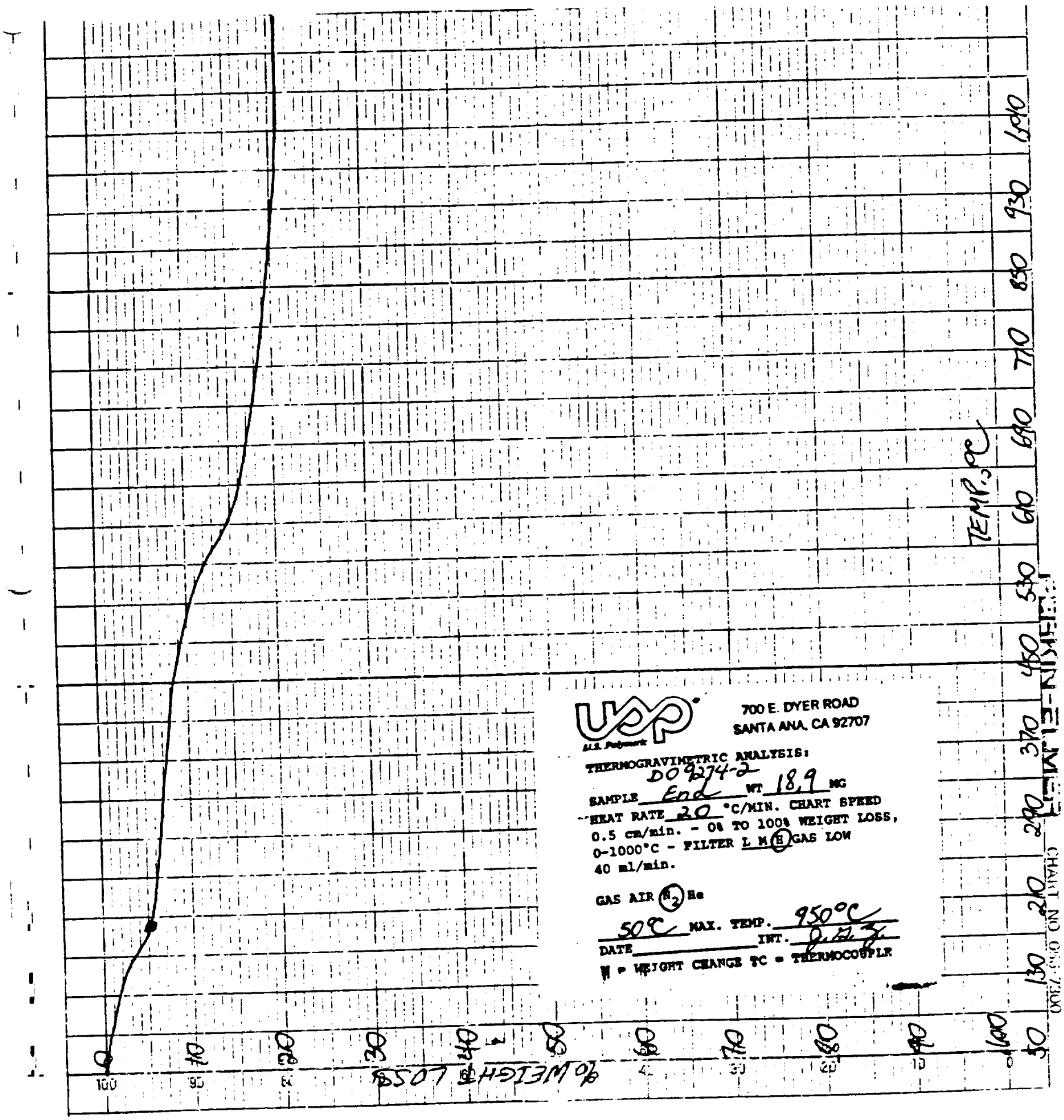

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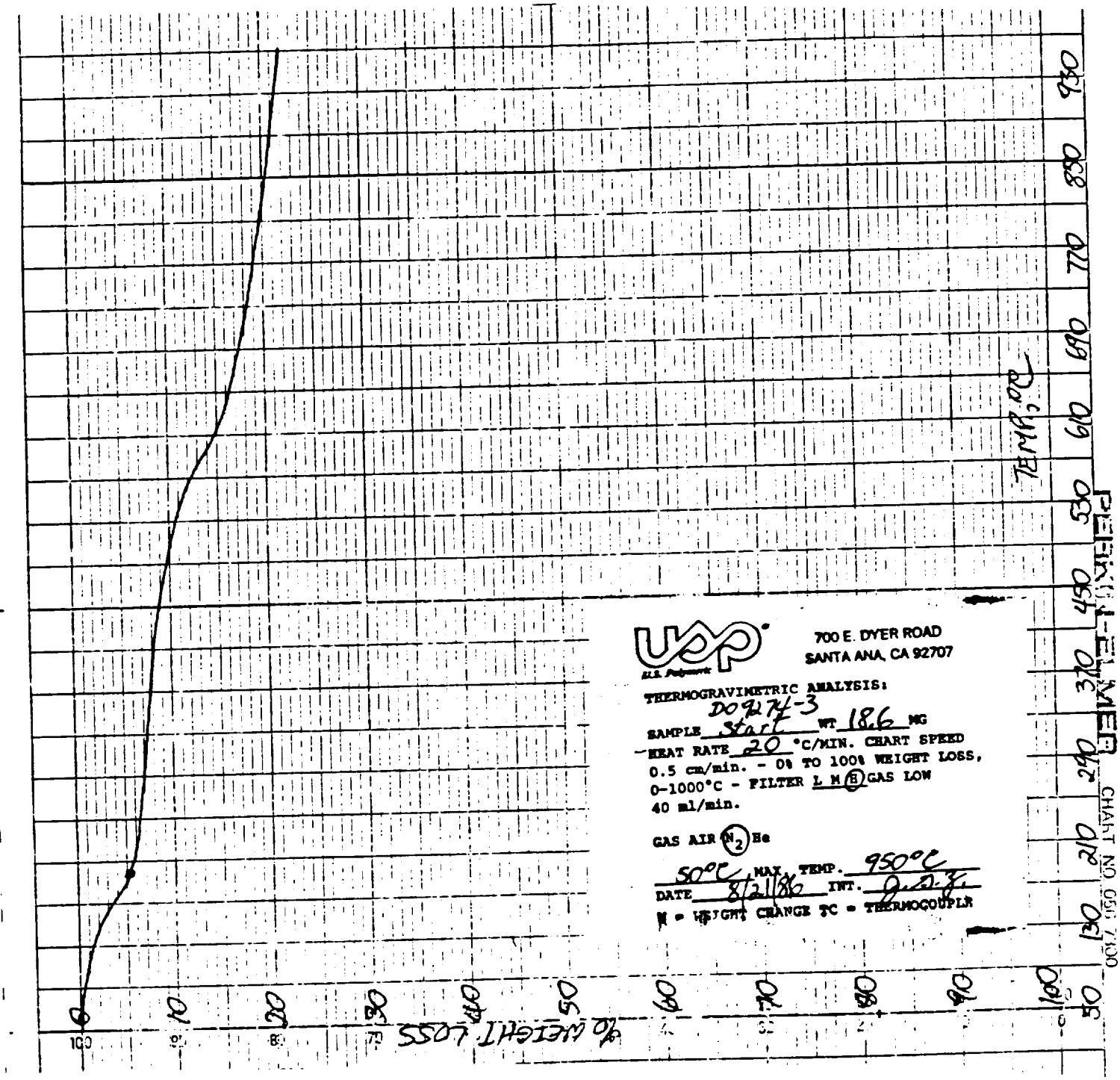

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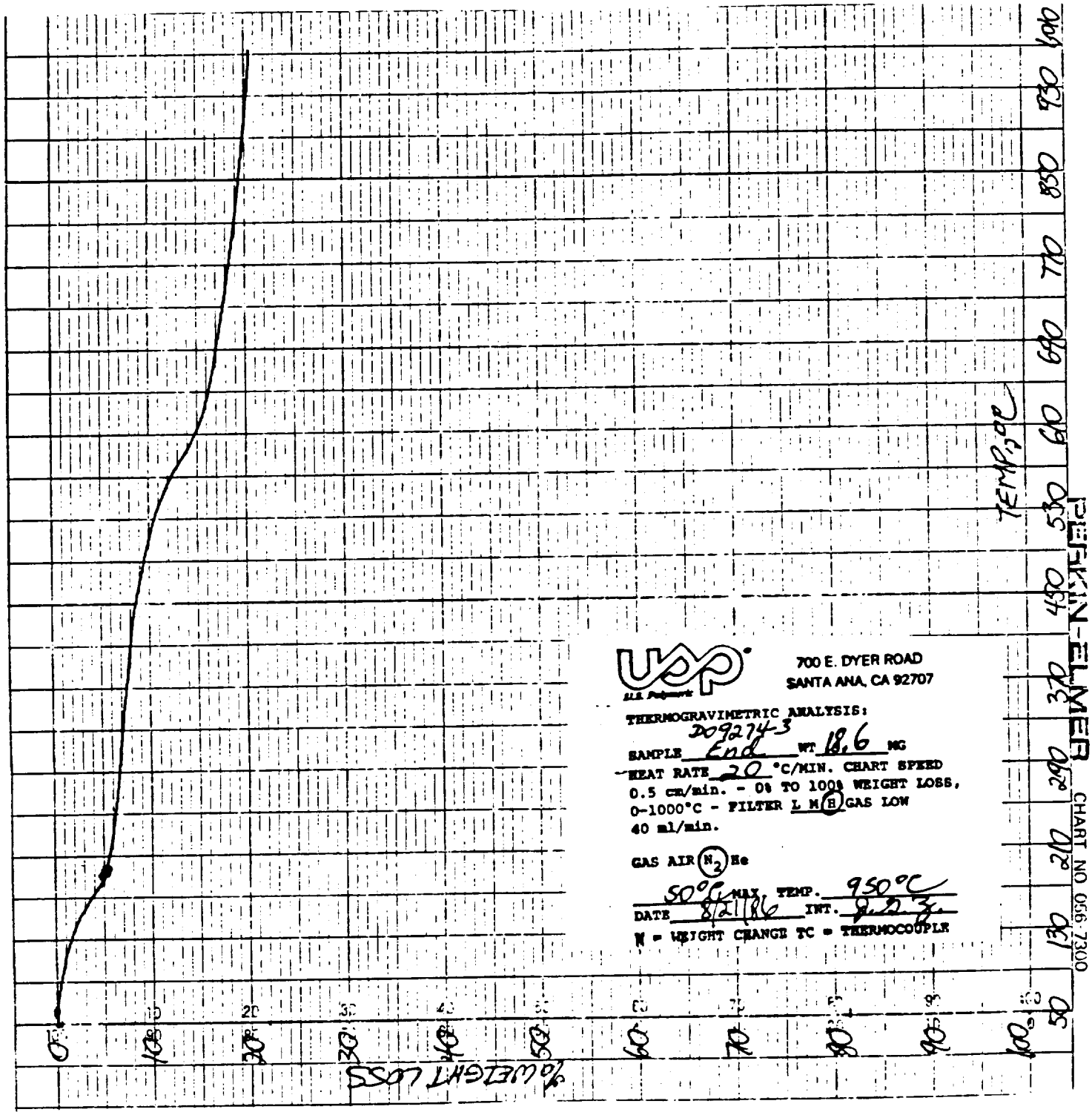

CHART 8G

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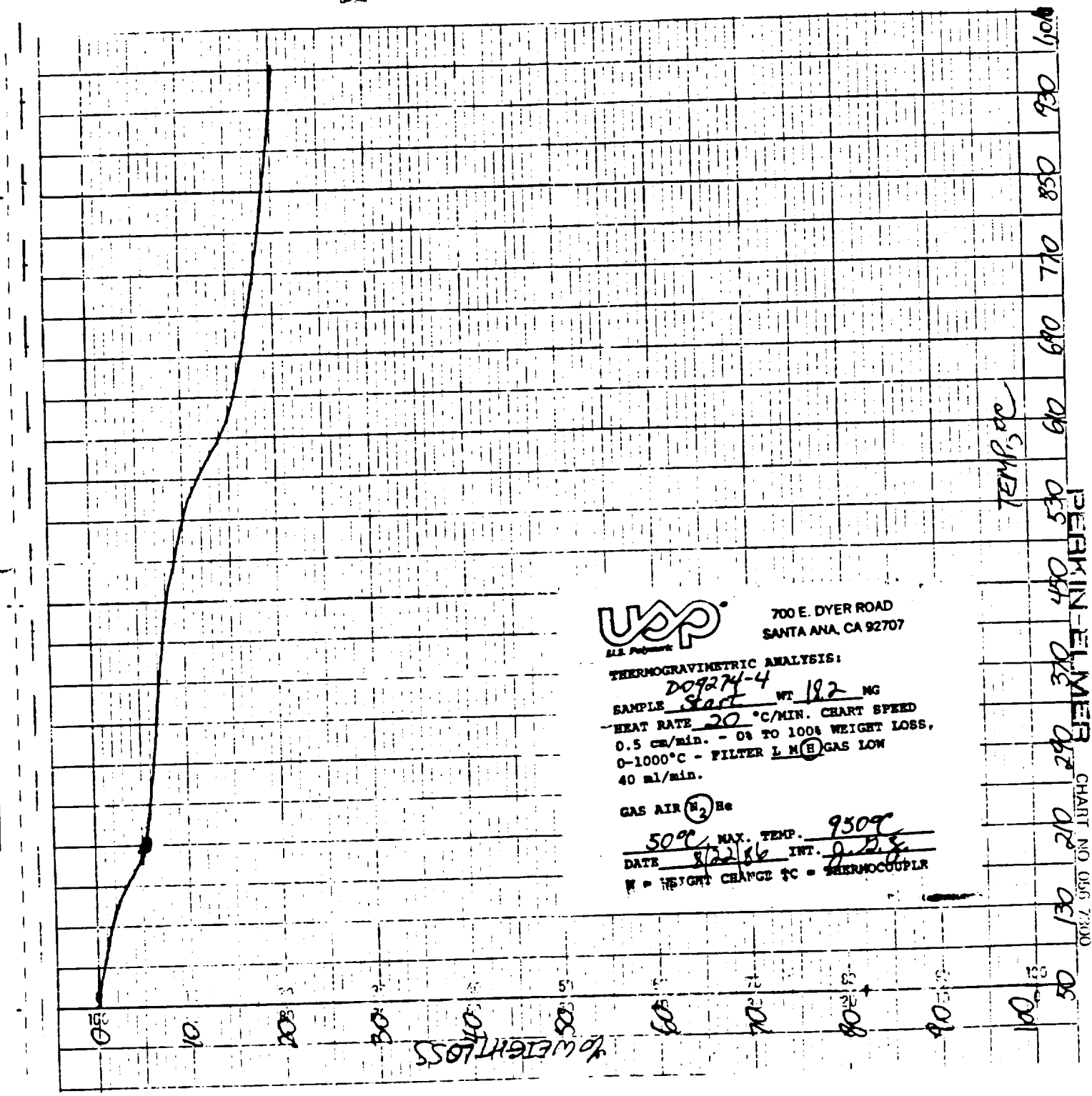

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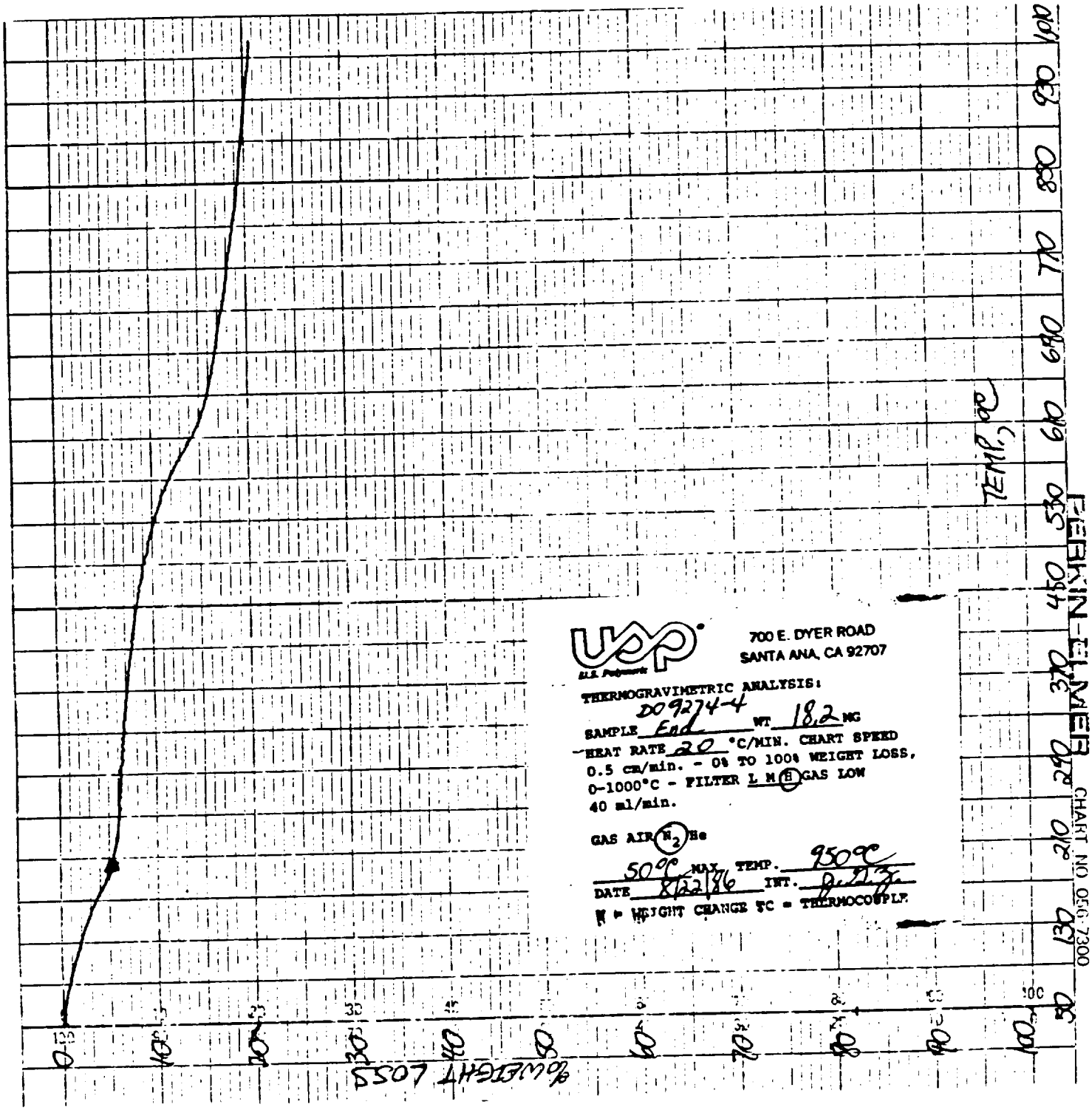

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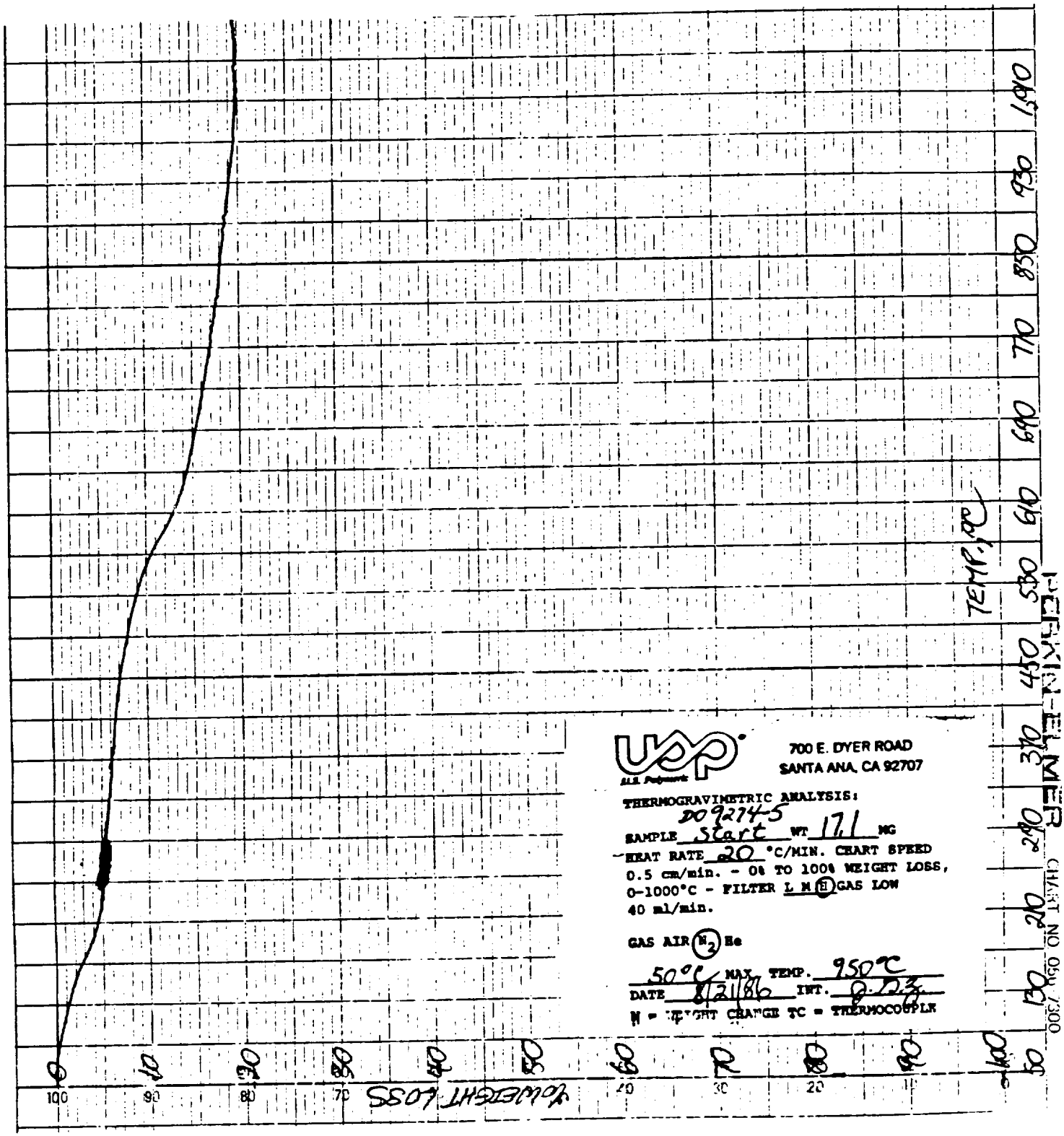

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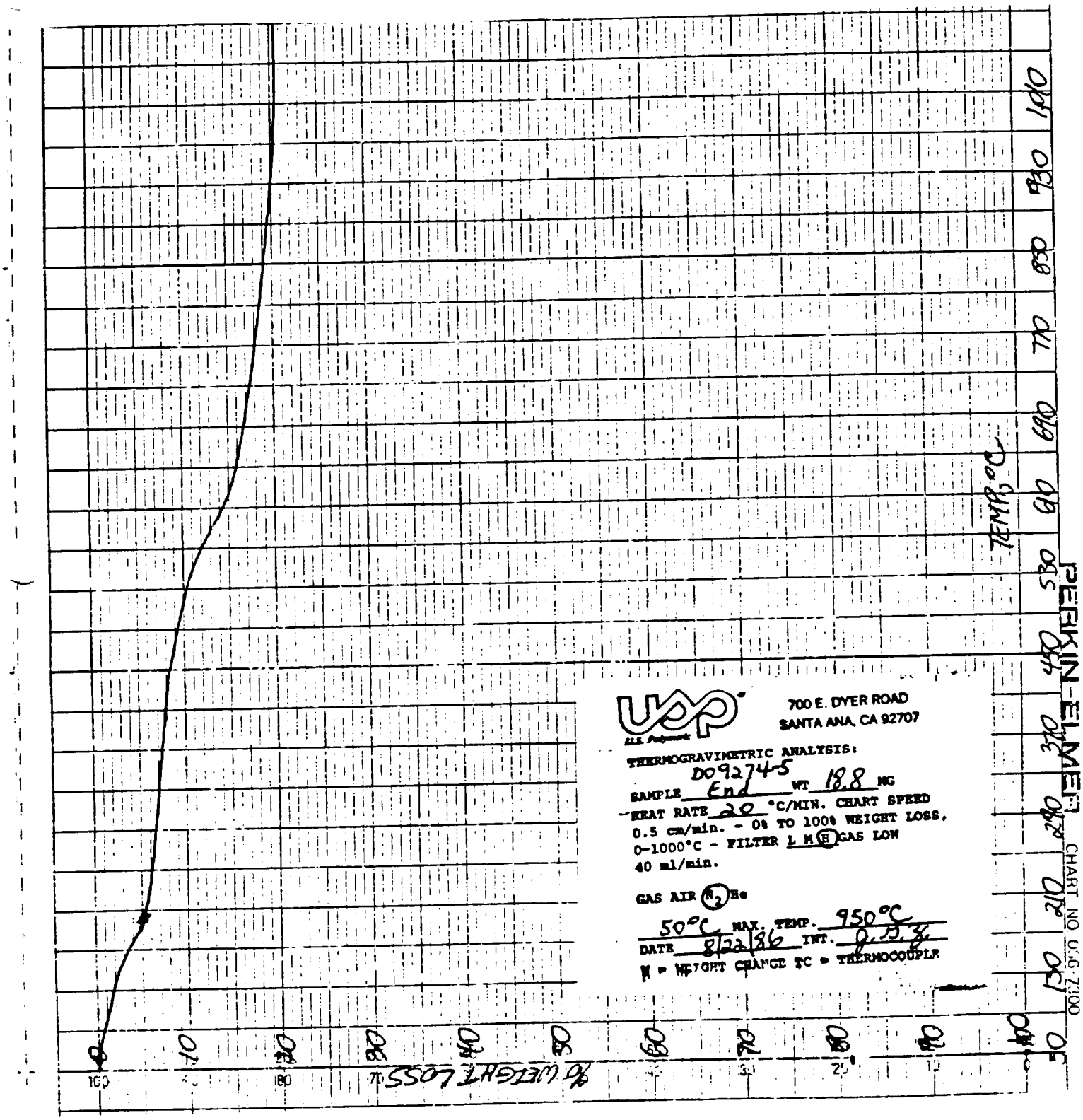

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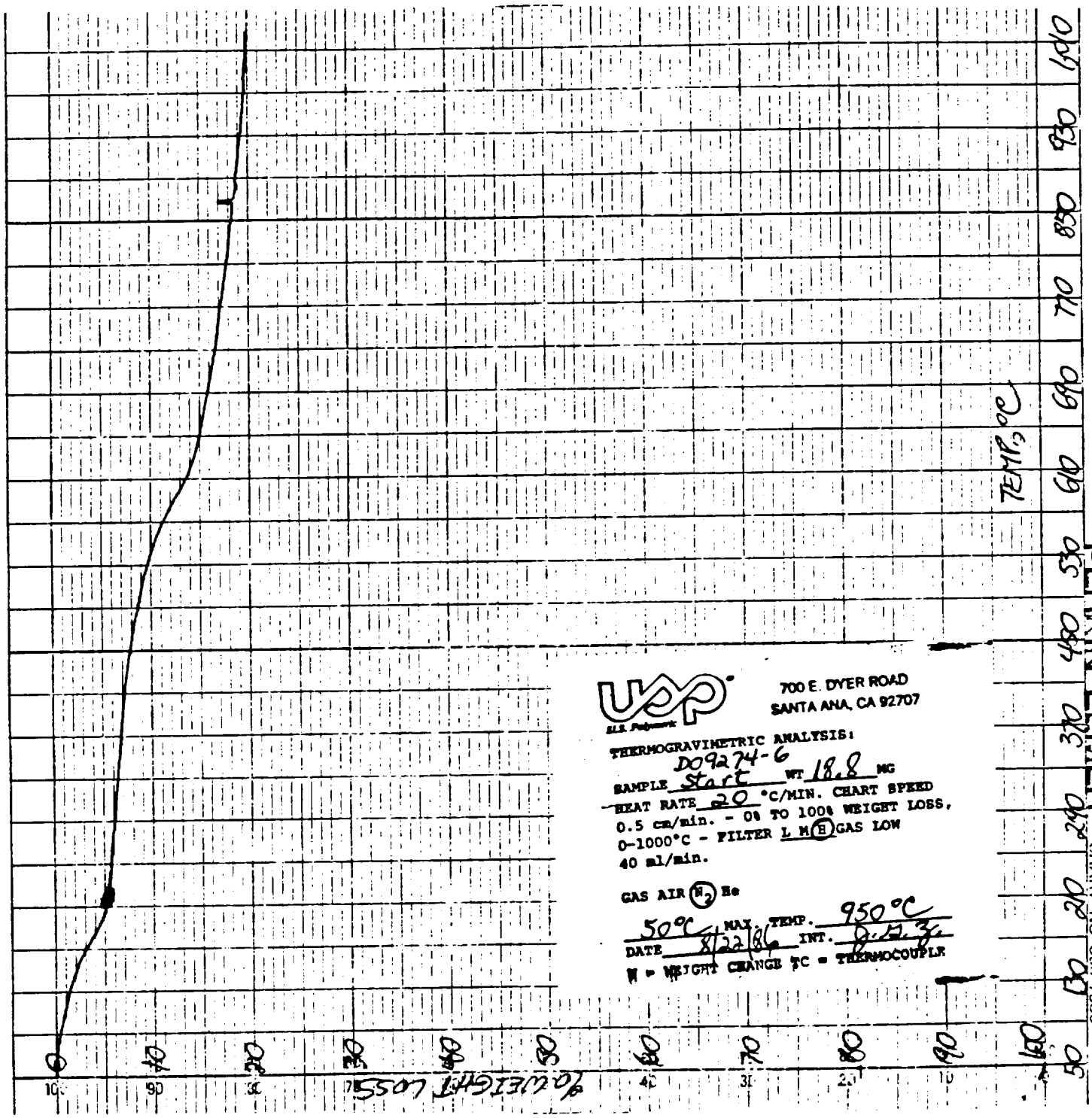

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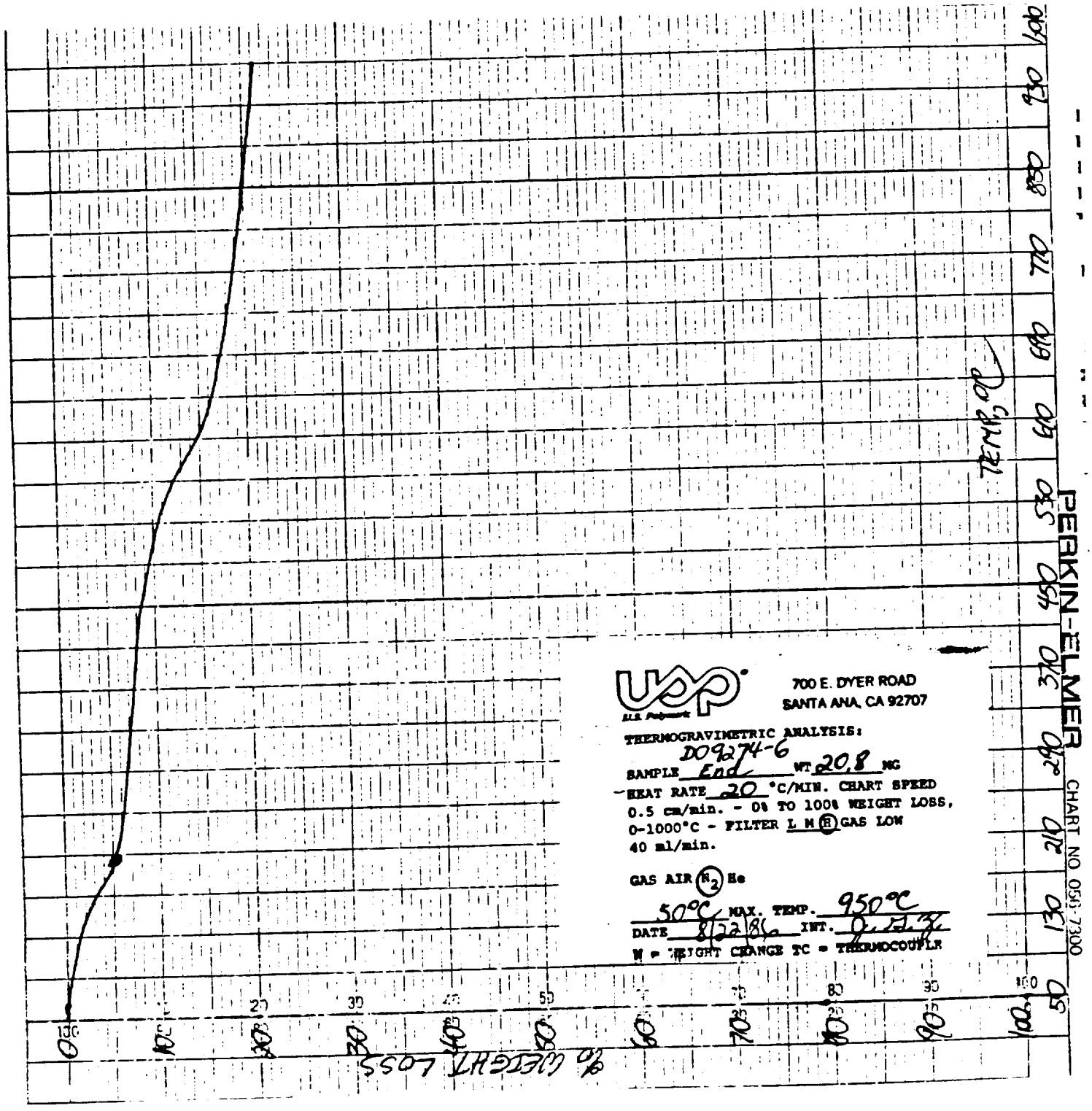

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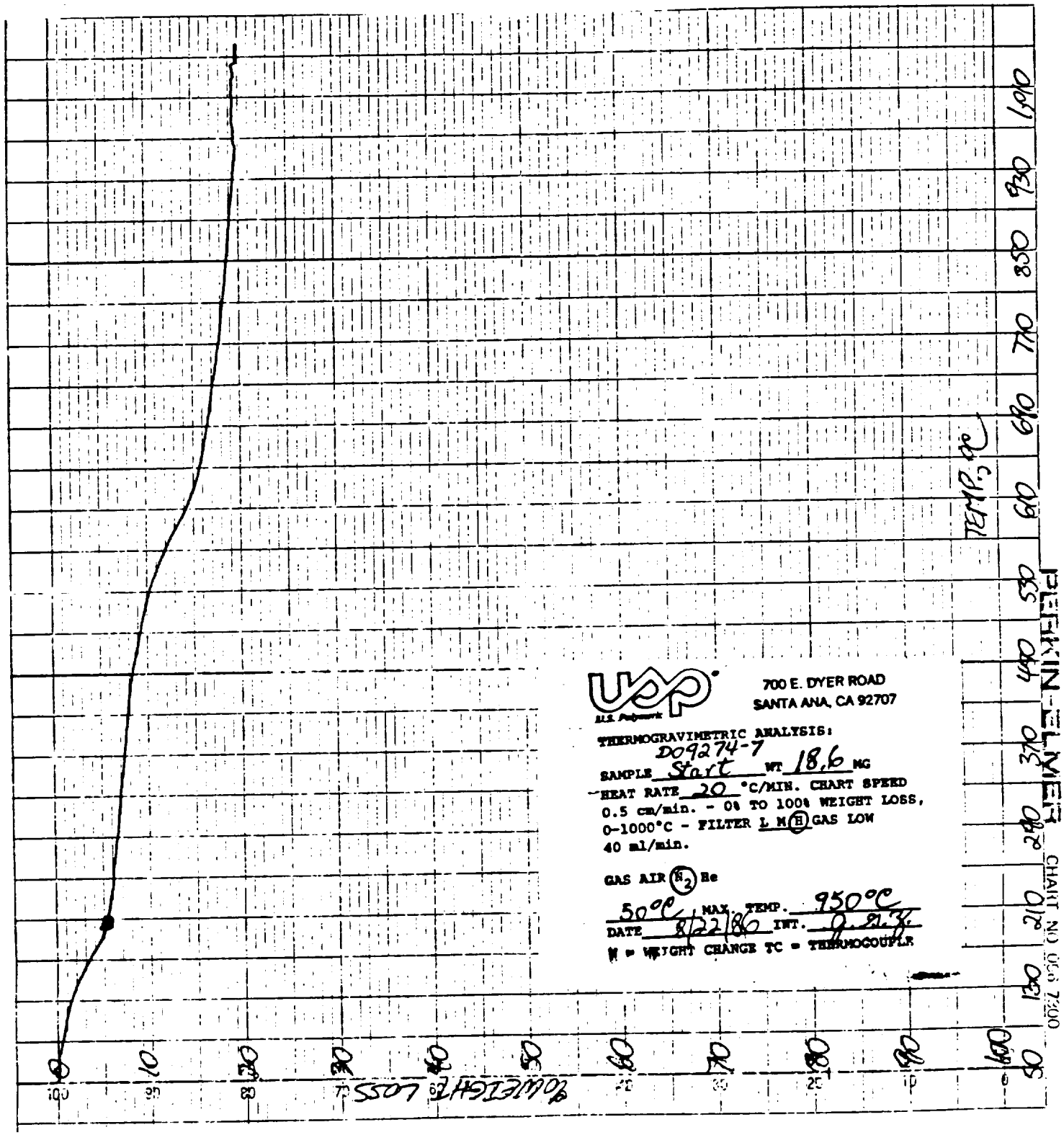

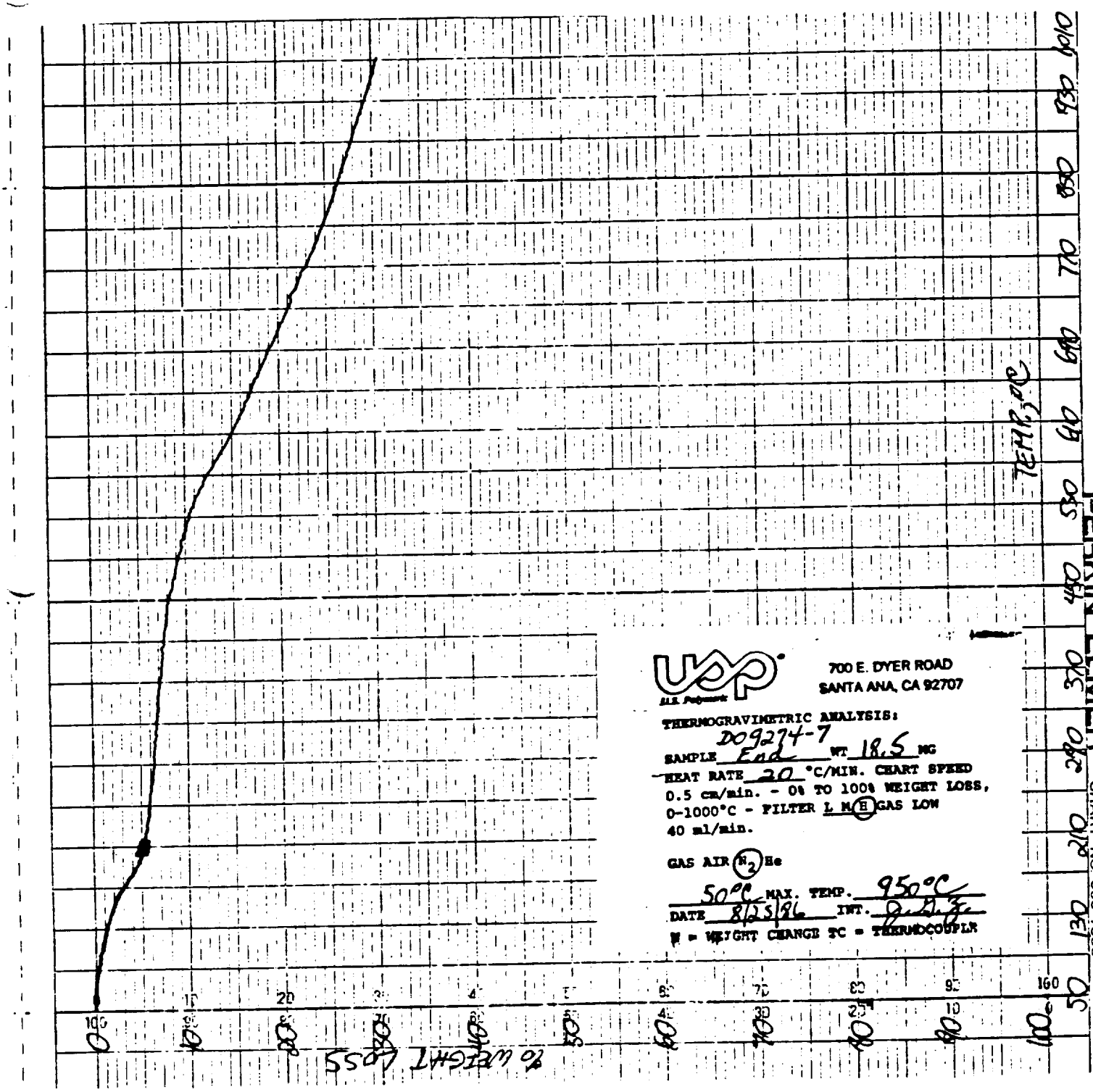

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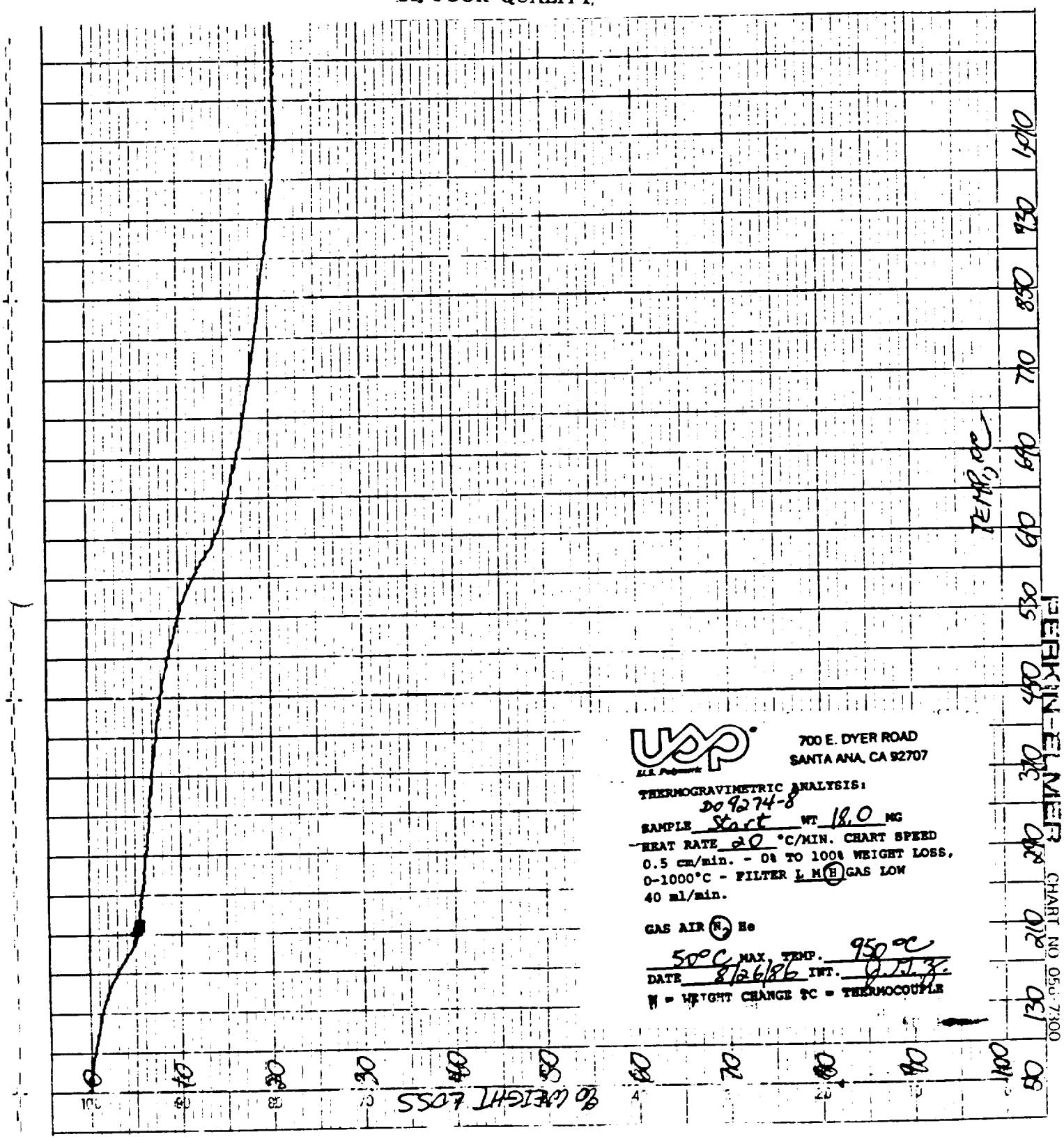

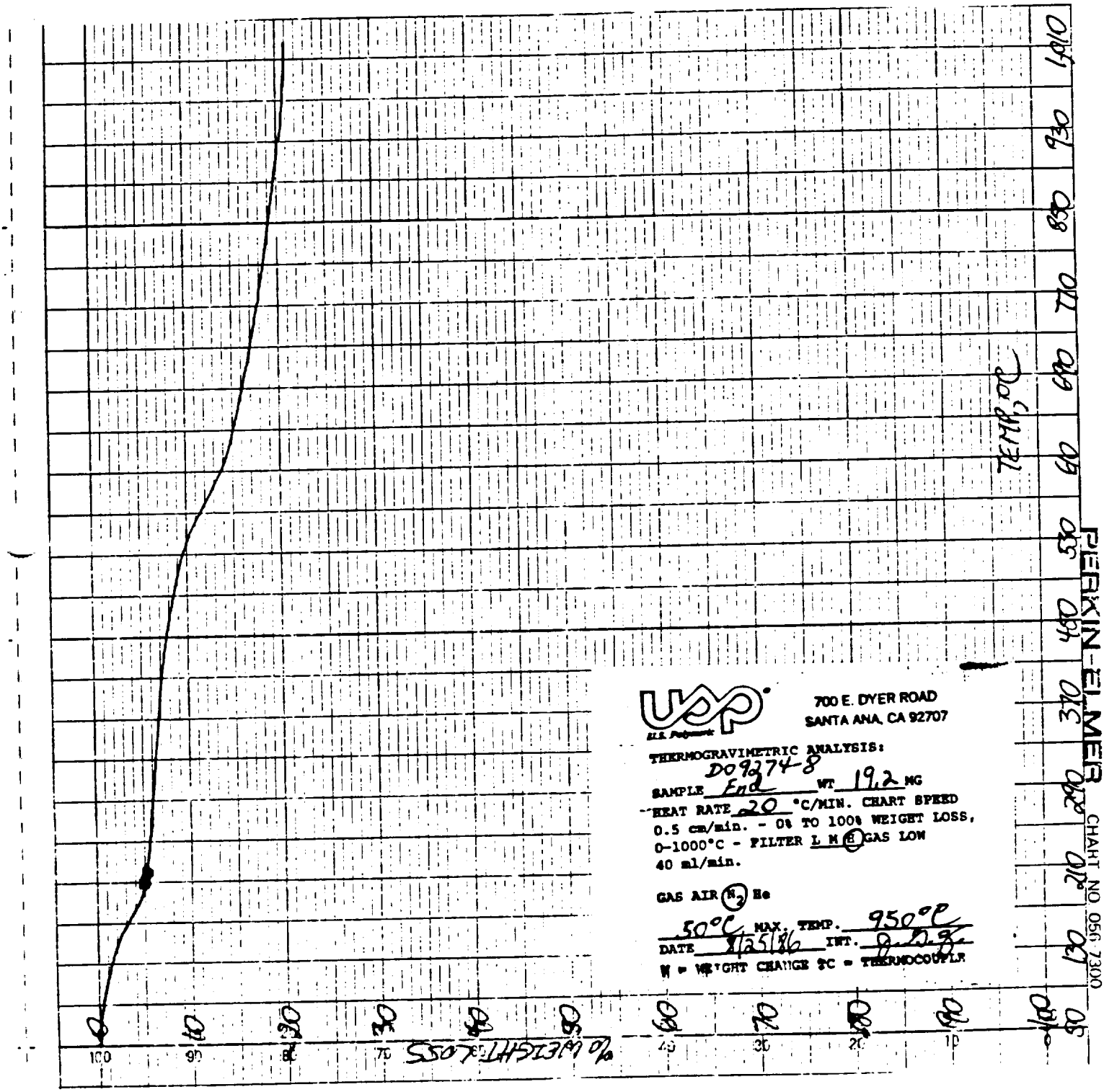

Chart 21F3

PART NO. 990088

RUN NO ____ DATE 2/24/84

OPERATOR DA

SAMPLE

D09374-3-EM0-(5)

ATM Air @ RT

FLOW RATE 3-5 SCFH

XPS

T-AXIS

SCALE, °C/in 50/20

PROG. RATE, °C/min 10

HEAT ✓ COOL ___ ISO ___

SHIFT, in 0

DTA-DSC

SCALE, °C/in ___

(mcal/sec)/in ___

WEIGHT, mg ___

REFERENCE ___

TGA

SCALE, mg/in ___

SUPPRESSION, mg ___

WEIGHT, mg ___

TIME CONST., sec ___

dY/dt (mg/min)/in ___

TMA

SCALE, mils/in 0.1/0.2

MODE Expansion

SAMPLE SIZE 0.143

LOAD, g ___

dY/dt (10X) (mils/min)/in ___

MEASURED VARIABLE

DUPONT Instruments

Chart 2161

PART NO. 990088

RUN NO. ___ DATE 2/24/92

OPERATOR TH

SAMPLE DGEBA-4-mmet-(1)

ATM Air @ 50

FLOW RATE 3-5 cc/m

T-AXIS

SCALE, °C/in 50 20

PROG RATE, °C/min 10

HEAT ✓ COOL ___ ISO ___

SHIFT, in 0

DTA-DSC

SCALE, °C/in ___

(mcal/sec)/in ___

WEIGHT, mg ___

REFERENCE ___

TGA

SCALE, mg/in ___

SUPPRESSION, mg ___

WEIGHT, mg ___

TIME CONST., sec ___

dY/dT (mg/min)/in ___

TMA

SCALE, mils/in 0.1/0.2

MODE Expansion

SAMPLE SIZE 0.659

LOAD, g 10

dY/dT (10X), (mils/min)/in ___

Wdly

DuPont Instruments

MEASURED VARIABLE

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Chart 2162

PART NO. 990088

RUN NO ___ DATE 7/22/94
OPERATOR DP
SAMPLE
D69374-Starr-(2) Std
ATM Am @ Std
FLOW RATE 3-5SCFH
w/ Ply

T-AXIS
SCALE, °C/in 50 20
PROG RATE, °C/min 10
HEAT / COOL ISO
SHIFT, in 0

DTA·DSC
SCALE, °C/in
(mcal/sec)/in
WEIGHT, mg
REFERENCE

TGA
SCALE, mg/in
SUPPRESSION, mg
WEIGHT, mg
TIME CONST., sec
dY/dT (mg/min)/in

TMA
SCALE, mils/in 6.1/0.2
MODE Expansion
SAMPLE SIZE 0.255
LOAD, g 1
dY/dT (10X) (mils/min)/in

MEASURED VARIABLE

DUPONT INSTRUMENTS

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Chart 21G3

PART NO. 990088

RUN NO. ___ DATE 9/12/96
OPERATOR RJ
SAMPLE
DOS374-4- smear (s)
ATM Air @ SIT
FLOW RATE Sealed
XPLY

T-AXIS
SCALE, °C/in 50 20
PROG RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST, sec ___
dY/(mg/min)/in ___

TMA
SCALE, mils/in 0.1/0.2
MODE Extension
SAMPLE SIZE 0.159
LOAD, g 10
dY/(10X)/(mils/min)/in ___

MEASURED VARIABLE

DUPONT Instruments

Chart 2164

PART NO. 990088

RUN NO ___ DATE 7/25/K
OPERATOR TH
SAMPLE
D09394-4-Inner - (1)
ATM Air @ 375
FLOW RATE 1-Stem

T-AXIS
SCALE, °C/in 50 20
PROG RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in ___ 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST., sec ___
dY/dT (mg/min) /in ___

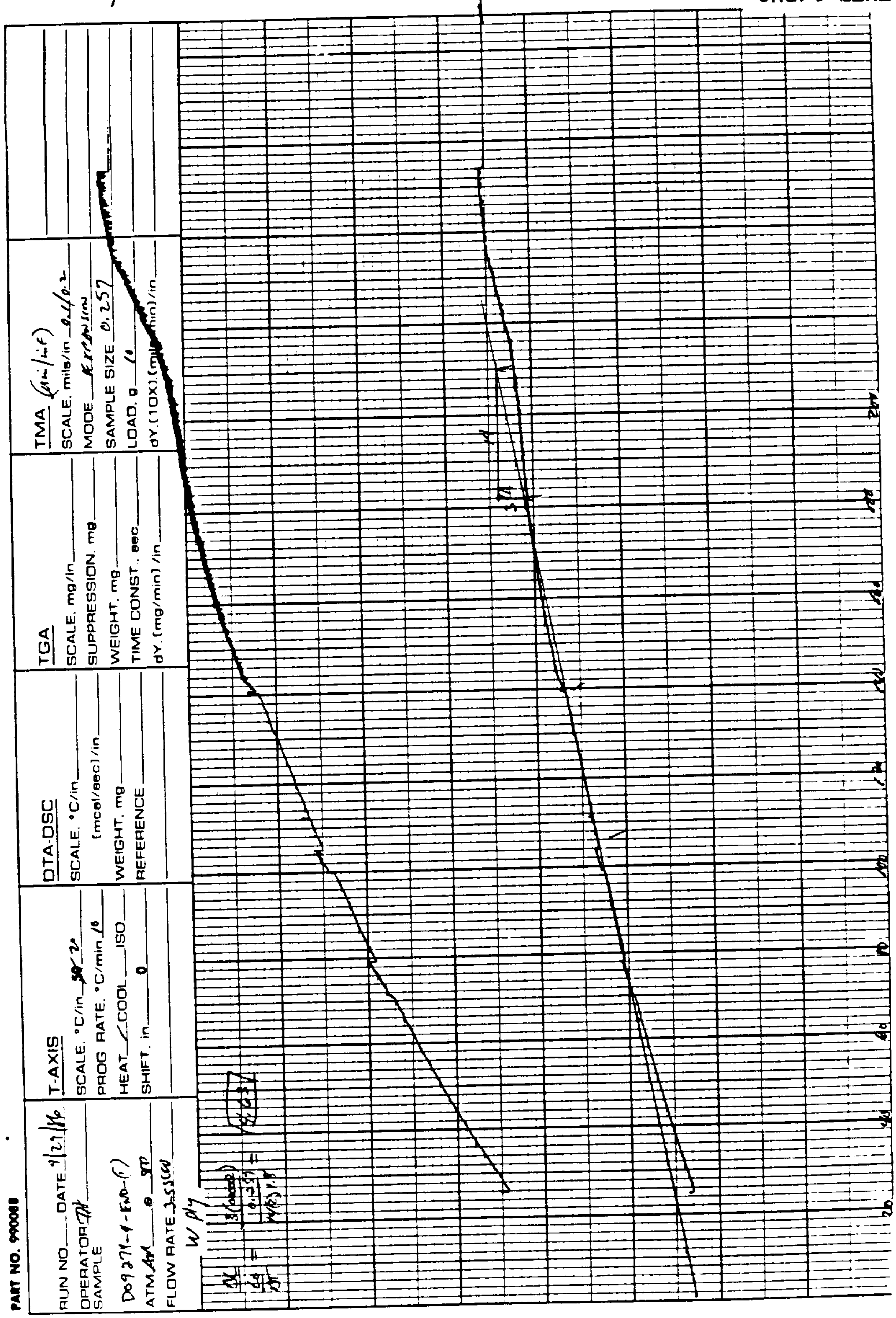
TMA
SCALE, mils/in 0.1/0.2
MODE Extension
SAMPLE SIZE 0.131
LOAD, g 1
dY/dT (10X) (mils/min) /in ___

XPL4

DuPont Instruments

MEASURED VARIABLE

Chart 21H1



Du Pont Instruments

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Chart 21H2

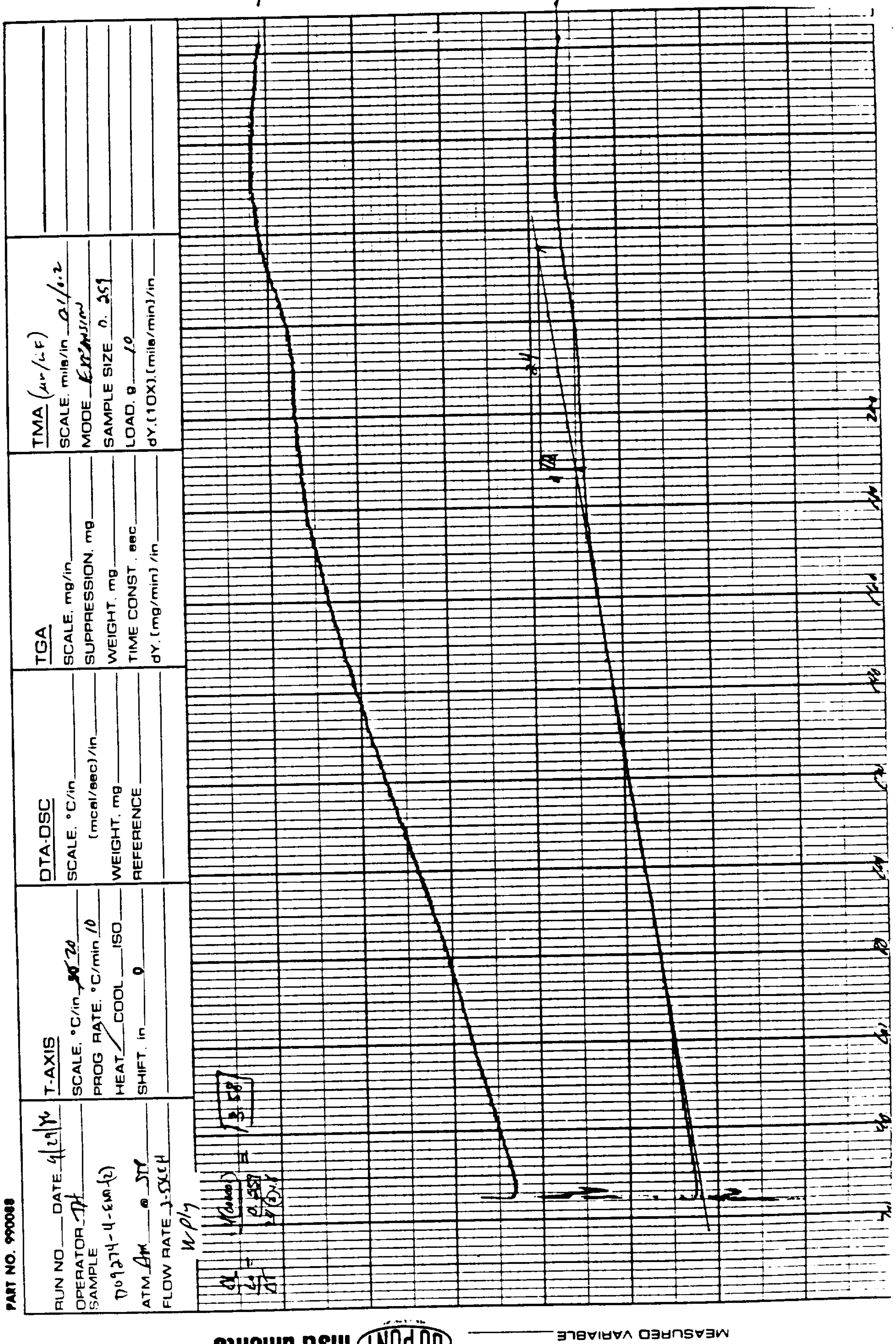

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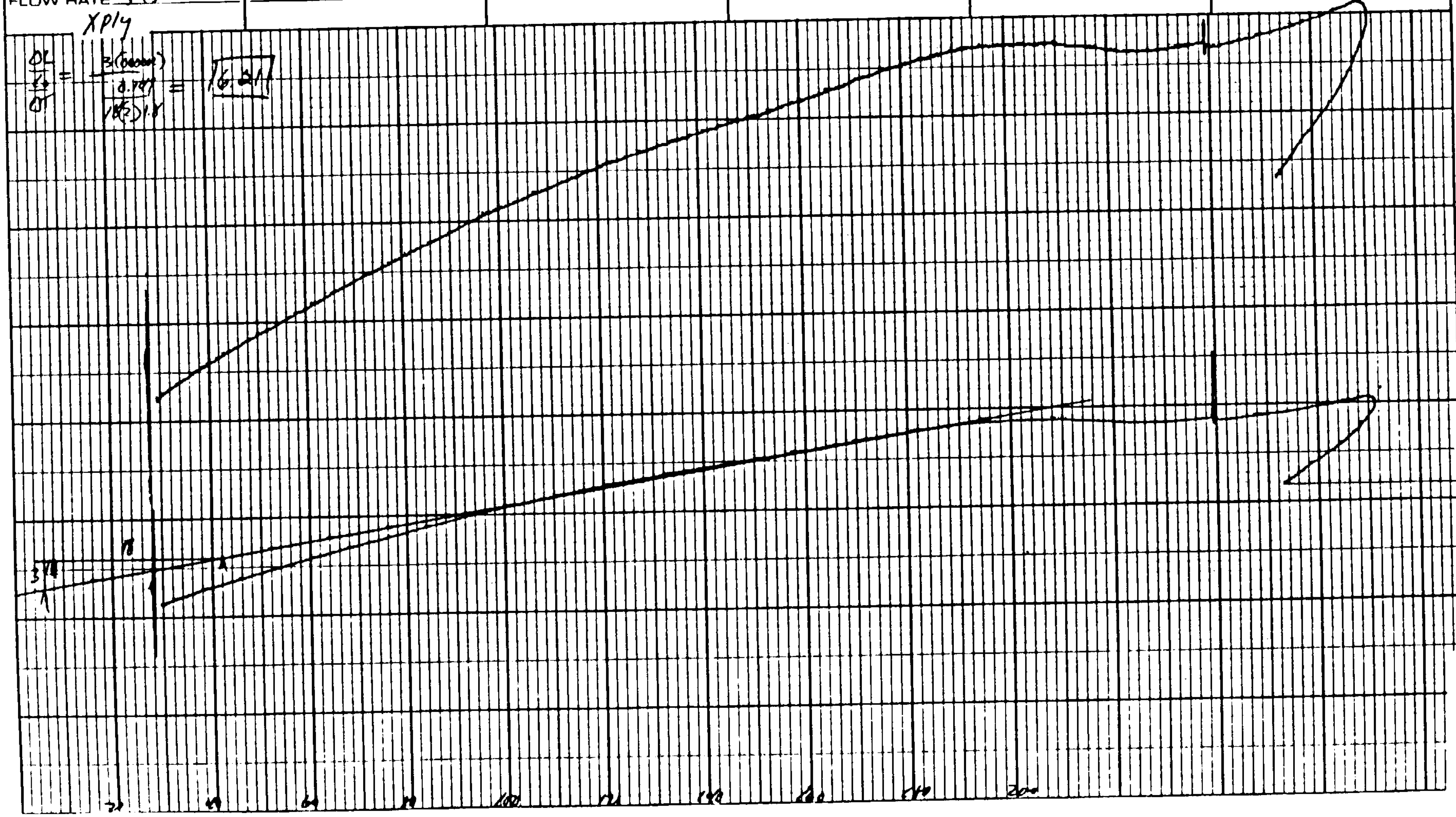
Chart 21H3

PART NO. 990088

RUN NO___ DATE 9/25/86	T-AXIS	DTA-DSC	TGA	TMA (µin/in°F)	
OPERATOR TJ	SCALE, °C/in 50 20	SCALE, °C/in___	SCALE, mg/in___	SCALE, mils/in 0.1/0.2	
SAMPLE D09271-4-END (4)	PROG RATE, °C/min 10	(mcal/sec)/in___	SUPPRESSION, mg___	MODE Expansion	
ATM Air @ STP	HEAT___ COOL___ ISO___	WEIGHT, mg___	WEIGHT, mg___	SAMPLE SIZE 0.149	
FLOW RATE 3-TYSH	SHIFT, in 0	REFERENCE___	TIME CONST, sec___	LOAD, g 10	
			dY, (mg/min)/in___	dY, (10X), (mils/min)/in___	



DUPONT Instruments

MEASURED VARIABLE

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Chart 21H4

PART NO. 990068

RUN NO ___ DATE 9/12/91
OPERATOR TD
SAMPLE
Do 7274-4-(EM) -(S)
ATM Air @ RT
FLOW RATE 25 cc/min
X ply

T-AXIS
SCALE, °C/in 50
PROG. RATE, °C/min 10
HEAT / COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in
(mcal/sec)/in
WEIGHT, mg
REFERENCE

TGA
SCALE, mg/in
SUPPRESSION, mg
WEIGHT, mg
TIME CONST., sec
dY/dT (mg/min)/in

TMA (μin/in)
SCALE, mils/in 0.1/0.2
MODE Expand
SAMPLE SIZE 0.151
LOAD, g 10
dY/dT (10X) (mils/min)/in

MEASURED VARIABLE

DUPONT Instruments

Chart 2111

PART NO. 990088

RUN NO ___ DATE 5/30/84

OPERATOR RP

SAMPLE

D9374-5-SMAT-(1)

ATM AM @ 2PT

FLOW RATE 35 SCCM

W/ PIN

T-AXIS

SCALE, °C/in 50/20

PROG RATE, °C/min 10

HEAT / COOL ___ ISO ___

SHIFT, in ___ 0 ___

DTA-DSC

SCALE, °C/in ___

(mcal/sec)/in ___

WEIGHT, mg ___

REFERENCE ___

TGA

SCALE, mg/in ___

SUPPRESSION, mg ___

WEIGHT, mg ___

TIME CONST., sec ___

dY/(mg/min)/in ___

TMA (in/in F)

SCALE, mils/in 81/20

MODE Expansion

SAMPLE SIZE 0.264

LOAD, g 10

dY/(10X)/(mils/min)/in ___

MEASURED VARIABLE

DUPONT Instruments

Chart 2112

PART NO. 990088

RUN NO. ___ DATE 3/30/96
OPERATOR TA
SAMPLE D0274-5-smear (2)
ATM Air @ STP
FLOW RATE 3-SCCM
w/poly

T-AXIS
SCALE, °C/in 50/20
PROG. RATE, °C/min 10
HEAT ___ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST., sec ___
dY/dT (mg/min) /in ___

TMA (um/inf)
SCALE, mils/in 0.1/0.2
MODE Expansion
SAMPLE SIZE 0.134
LOAD, g 10
dY/dT (10X) (mils/min) /in ___

MEASURED VARIABLE

DUPONT Instruments

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PART NO. 990068

RUN NO ___ DATE 9/25/96	T-AXIS	DTA-DSC	TGA	TMA (um/in F)	
OPERATOR [illegible]	SCALE, °C/in 50 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
1) 09394-5- sample - (3)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.129	
ATM Air @ RT	SHIFT, in 0	REFERENCE	TIME CONST., sec	LOAD, g 10	
FLOW RATE 3-5 cc/min			dY, (mg/min) /in	dY, (10X), (mils/min)/in	

XPly

$\frac{dL}{dT} = \frac{\Delta L}{\Delta T} = \frac{3\ (mm)}{0.129} = 18.07$

$\frac{2\ (mm)}{0.129} = 5.38$

DUPONT Instruments

MEASURED VARIABLE

Chart 2113

Chart 2114

PART NO. 990088

RUN NO. ___ DATE 2/25/94

OPERATOR PL

SAMPLE

D01394-5-smar-(4)

ATM Air @ RT

FLOW RATE 2-5511CM

XPHY

T-AXIS

SCALE, °C/in 50 MM

PROG RATE, °C/min 10

HEAT ✓ COOL ___ ISO ___

SHIFT, in 0

DTA-DSC

SCALE, °C/in ___

(mcal/sec)/in ___

WEIGHT, mg ___

REFERENCE ___

TGA

SCALE, mg/in ___

SUPPRESSION, mg ___

WEIGHT, mg ___

TIME CONST., sec ___

dY/dt (mg/min)/in ___

TMA (μm/in)

SCALE, mils/in Inflate

MODE Expansion

SAMPLE SIZE 0.130

LOAD, g 10

dY/dt (10X), (mils/min)/in ___

DUPONT Instruments

MEASURED VARIABLE

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Chart 21J1

PART NO. 990088

RUN NO ___ DATE 7/30/94
OPERATOR PH
SAMPLE
D09274-5-EXD-(1)
ATM Air @ 50
FLOW RATE 2-5(est)
w/dry

T-AXIS
SCALE, °C/in 50 20
PROG RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST, sec ___
dY/dT (mg/min) /in ___

TMA (µm/in F)
SCALE, mils/in Auto
MODE Extension
SAMPLE SIZE 0.340
LOAD, g 10
dY/dT (10X) (mils/min)/in ___

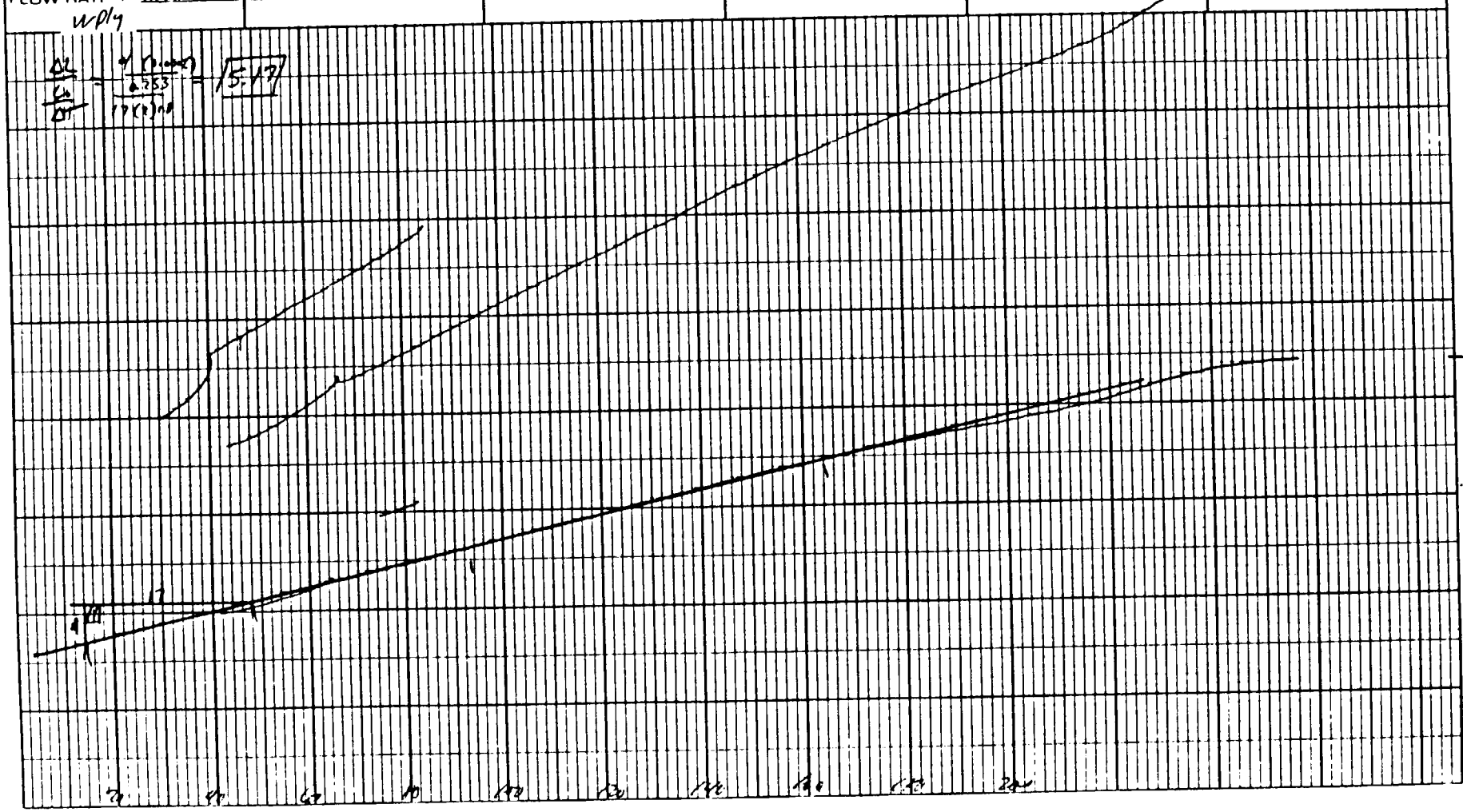
MEASURED VARIABLE

DUPONT instruments

PART NO. 990088

RUN NO ___ DATE 9/30/14	T-AXIS	DTA-DSC	TGA	TMA (μm/in F)	
OPERATOR R	SCALE, °C/in 50 M	SCALE, °C/in ___	SCALE, mg/in ___	SCALE, mils/in 5/10 2	
SAMPLE	PROG RATE, °C/min 10	(mcal/sec)/in ___	SUPPRESSION, mg ___	MODE Expansion	
DOS374-5-END-(2)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg ___	WEIGHT, mg ___	SAMPLE SIZE 0.253	
ATM Air @ 50	SHIFT, in 0	REFERENCE ___	TIME CONST., sec ___	LOAD, g 10	
FLOW RATE 3-5 SCFH			dY, (mg/min) /in ___	dY, (10X), (mils/min) /in ___	
w/ply					

$$\frac{\Delta L}{L_0 \Delta T} = \frac{4\,(0.004)}{0.253} = \boxed{5.17}$$



DUPONT Instruments

MEASURED VARIABLE ___

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Chart 21J2

PART NO. 990088

RUN NO ___ DATE 7/30/96	T-AXIS	DTA-DSC	TGA	TMA (μm/in F)	
OPERATOR TP	SCALE. °C/in 50 20	SCALE. °C/in	SCALE. mg/in	SCALE. mils/in 0.1/0.2	
SAMPLE	PROG RATE. °C/min 10	(mcal/sec)/in	SUPPRESSION. mg	MODE EXPANSION	
D09574-5-END-(3)	HEAT ✓ COOL ___ ISO ___	WEIGHT. mg	WEIGHT. mg	SAMPLE SIZE 0.148	
ATM Air @ STP	SHIFT. in 0	REFERENCE	TIME CONST. sec	LOAD. g 10	
FLOW RATE 3-5 SCFH			dY. (mg/min) /in	dY. (10X). (mils/min)/in	

XPly

$\frac{\Delta L}{L_0} = \frac{4.00\text{ mm}}{0.148} = 10.01$

MEASURED VARIABLE

DUPONT Instruments

CAT 1 UNIT

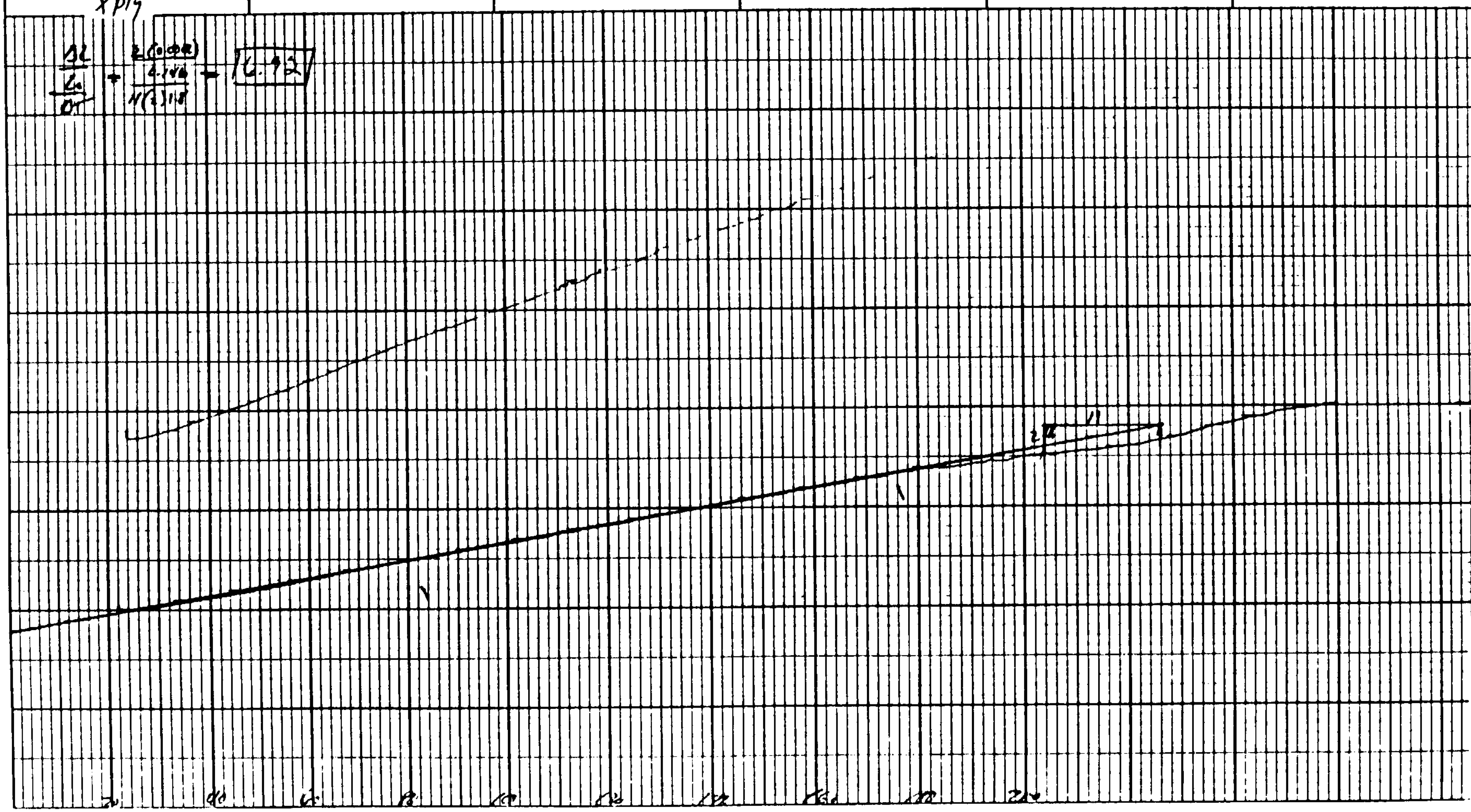
Chart 21J4

PART NO. 990088

RUN NO ___ DATE 12/1/84	T-AXIS	DTA-DSC	TGA	TMA (µin/in°F)
OPERATOR TH	SCALE, °C/in 50 2	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2
SAMPLE: D09374-5-END-(4)	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion
ATM Air @ STP	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.146
FLOW RATE 3-SSCFH	SHIFT, in 0	REFERENCE	TIME CONST., sec	LOAD, g 10
			dY, (mg/min)/in	dY, (10X), (mils/min)/in

X ply

$$\frac{\Delta L / L_0}{\Delta T} = \frac{2(0.002)/0.146}{11(2)1.8} = \boxed{6.92}$$



MEASURED VARIABLE

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Chart 21K1

PART NO. 990008

RUN NO ____ DATE 1/30/84

OPERATOR RI

SAMPLE

Polyethylene (1)

ATM Air @ STP

FLOW RATE 3-5 SCFH

T-AXIS

SCALE, °C/in 50 20

PROG RATE, °C/min 10

HEAT ✓ COOL ___ ISO ___

SHIFT, in 0

DTA-DSC

SCALE, °C/in ___

(mcal/sec)/in ___

WEIGHT, mg ___

REFERENCE ___

TGA

SCALE, mg/in ___

SUPPRESSION, mg ___

WEIGHT, mg ___

TIME CONST, sec ___

dY, (mg/min) /in ___

TMA (μm/inF)

SCALE, mils/in 0.1/0.2

MODE Expansion

SAMPLE SIZE 0.13

LOAD, g 10

dY, (10X), (mils/min)/in ___

Wrinkle

MEASURED VARIABLE

DUPONT Instruments

Chart 21K2

PART NO. 990088

RUN NO____ DATE 9/30/W	T-AXIS	DTA-DSC	TGA	TMA (μm/in F)
OPERATOR Pl	SCALE, °C/in 20	SCALE, °C/in____	SCALE, mg/in____	SCALE, mils/in 0.1/0.2
SAMPLE D09874-6-Start-(2)	PROG. RATE, °C/min 10	(mcal/sec)/in____	SUPPRESSION, mg____	MODE Expansion
ATM Air @ STP	HEAT ✓ COOL____ ISO____	WEIGHT, mg____	WEIGHT, mg____	SAMPLE SIZE 0.259
FLOW RATE 1-5 SLFH w dry	SHIFT, in 0	REFERENCE____	TIME CONST., sec____	LOAD, g 10
			dY, (mg/min)/in____	dY, (10X) (mils/min)/in____

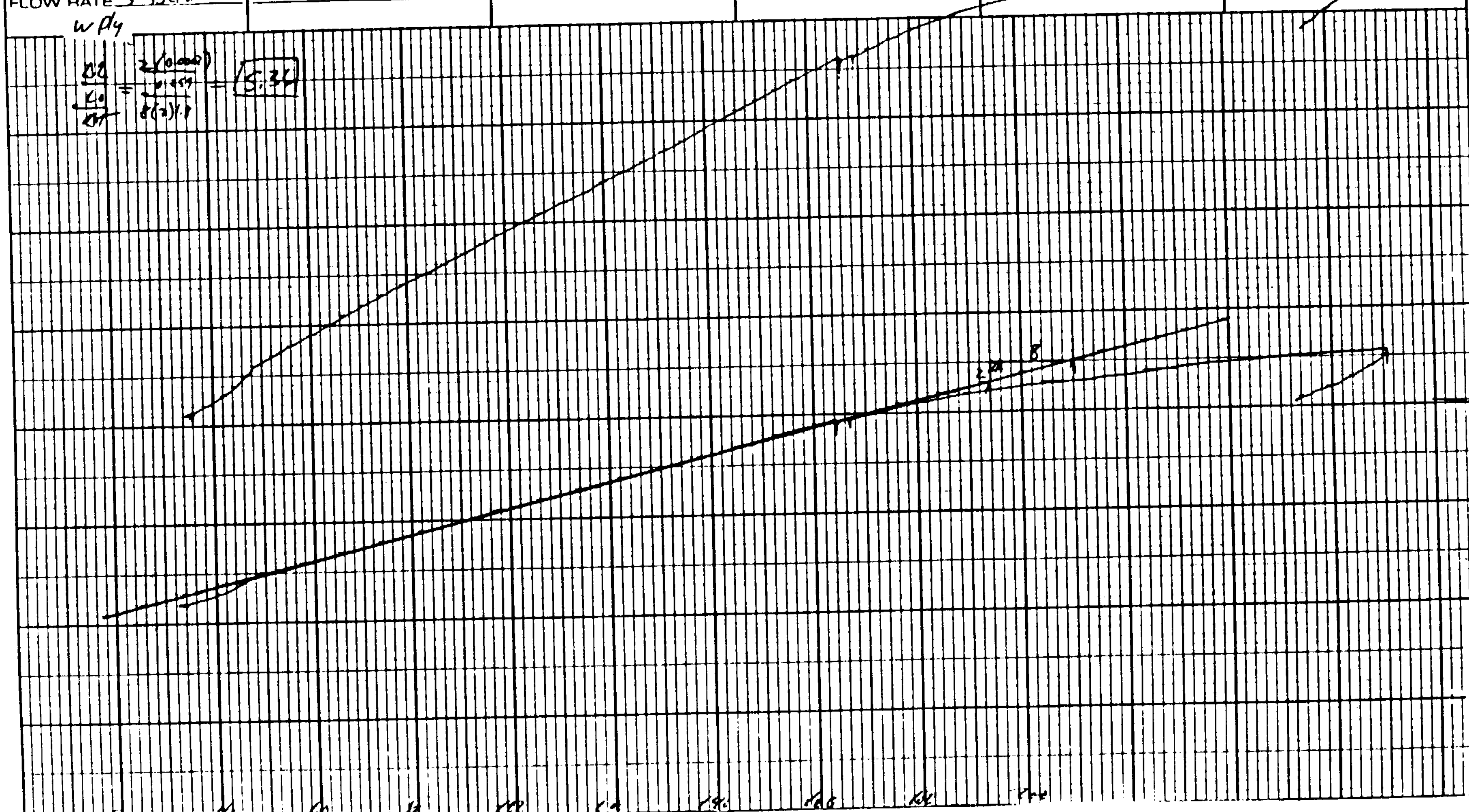

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Chart 21K3

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Chart 21K4

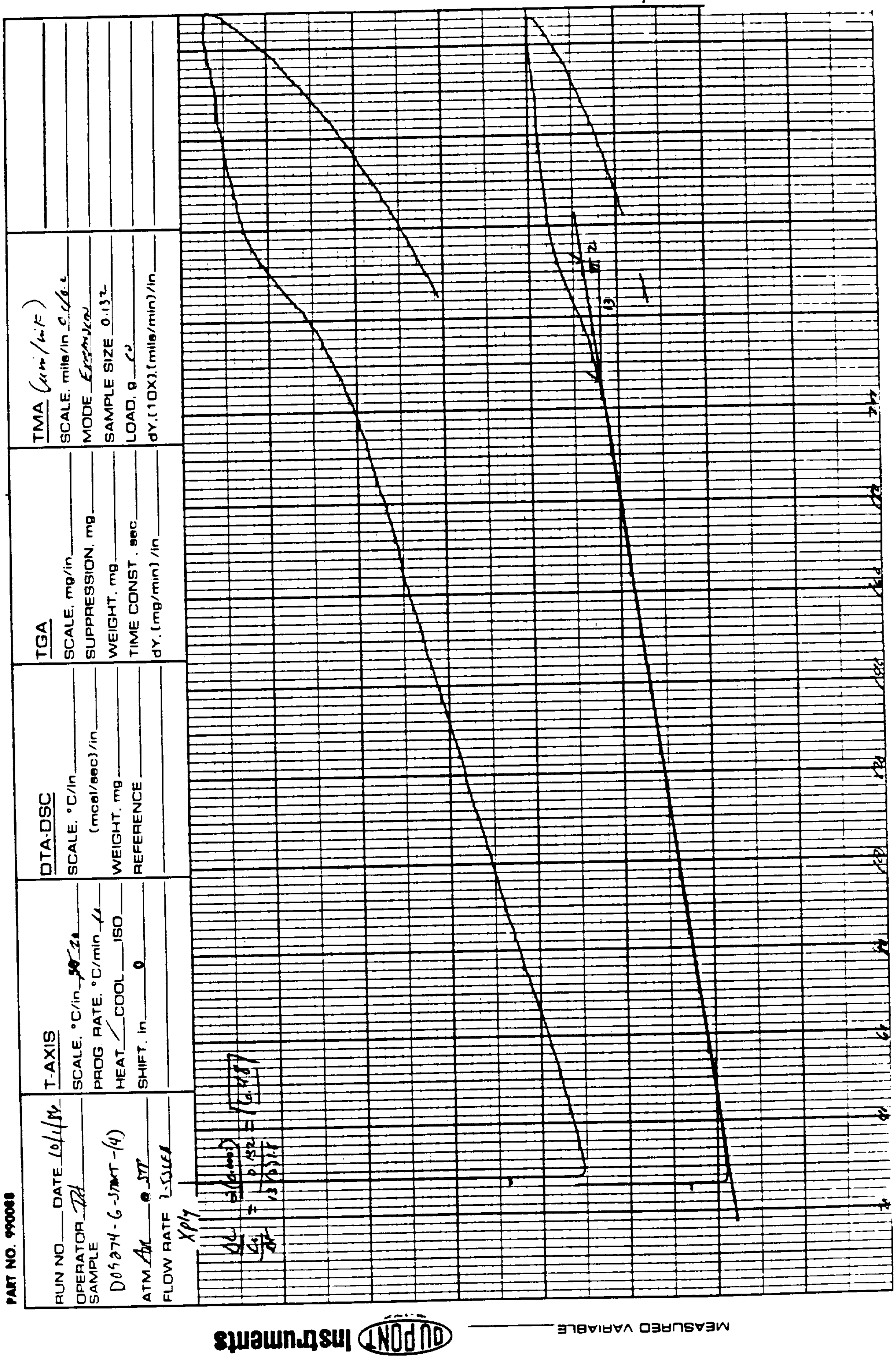

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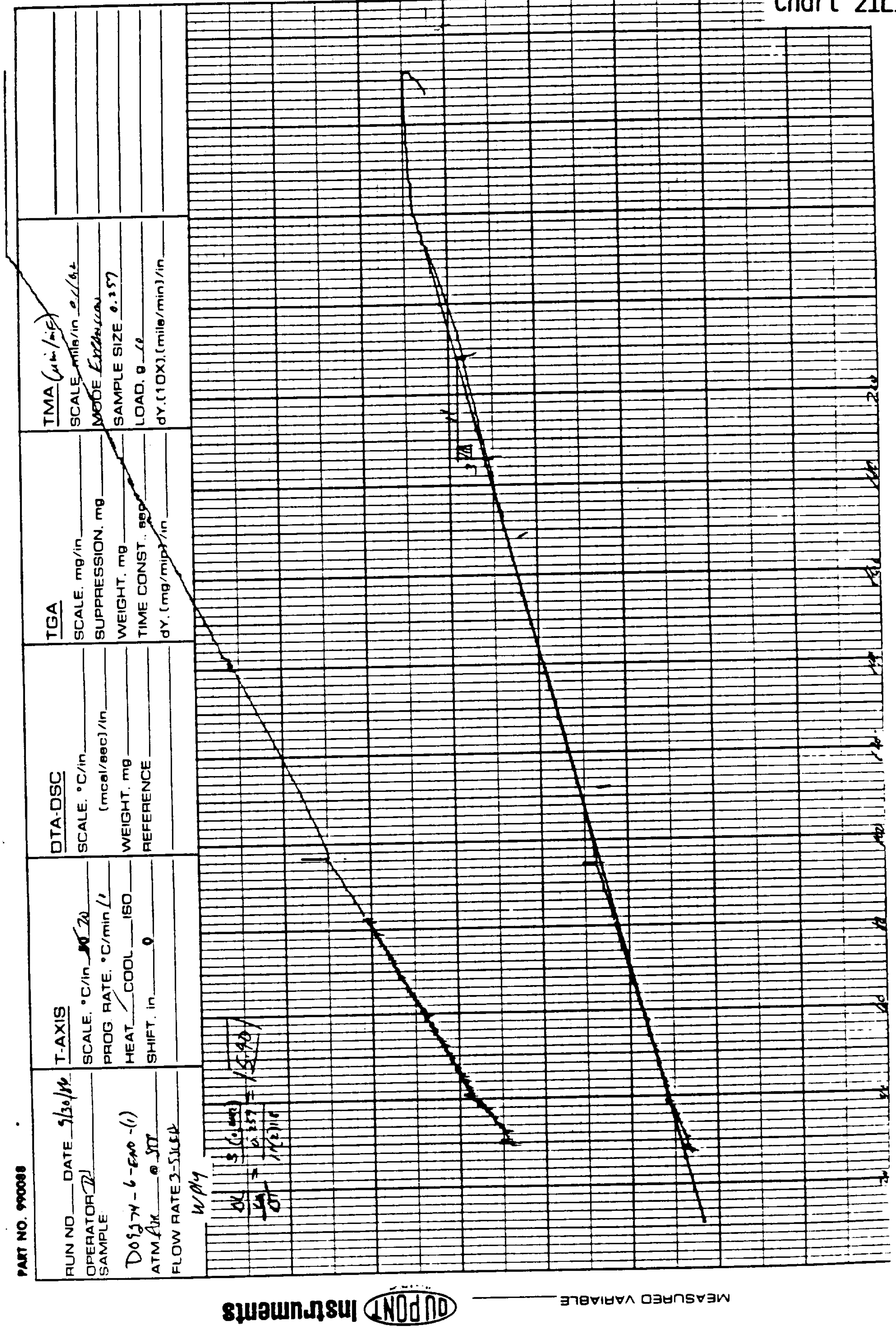
Chart 21L1



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PART NO. 990088

RUN NO ___ DATE 9/30/94	T-AXIS	DTA-DSC	TGA	TMA (μm/μF)	
OPERATOR JH	SCALE, °C/in 100 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
D09274-6-END-(2)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.259	
ATM Air @ 50	SHIFT, in 0	REFERENCE	TIME CONST, sec	LOAD, g 0	
FLOW RATE 25 scfh			dY, (mg/min) /in	dY, (10X), (mils/min) /in	
w/ly					

$$\frac{\Delta H}{\Delta T} = \frac{4(0.042)}{0.259} = \frac{}{\pi(12)1.8} = 15.05$$

MEASURED VARIABLE

DUPONT Instruments

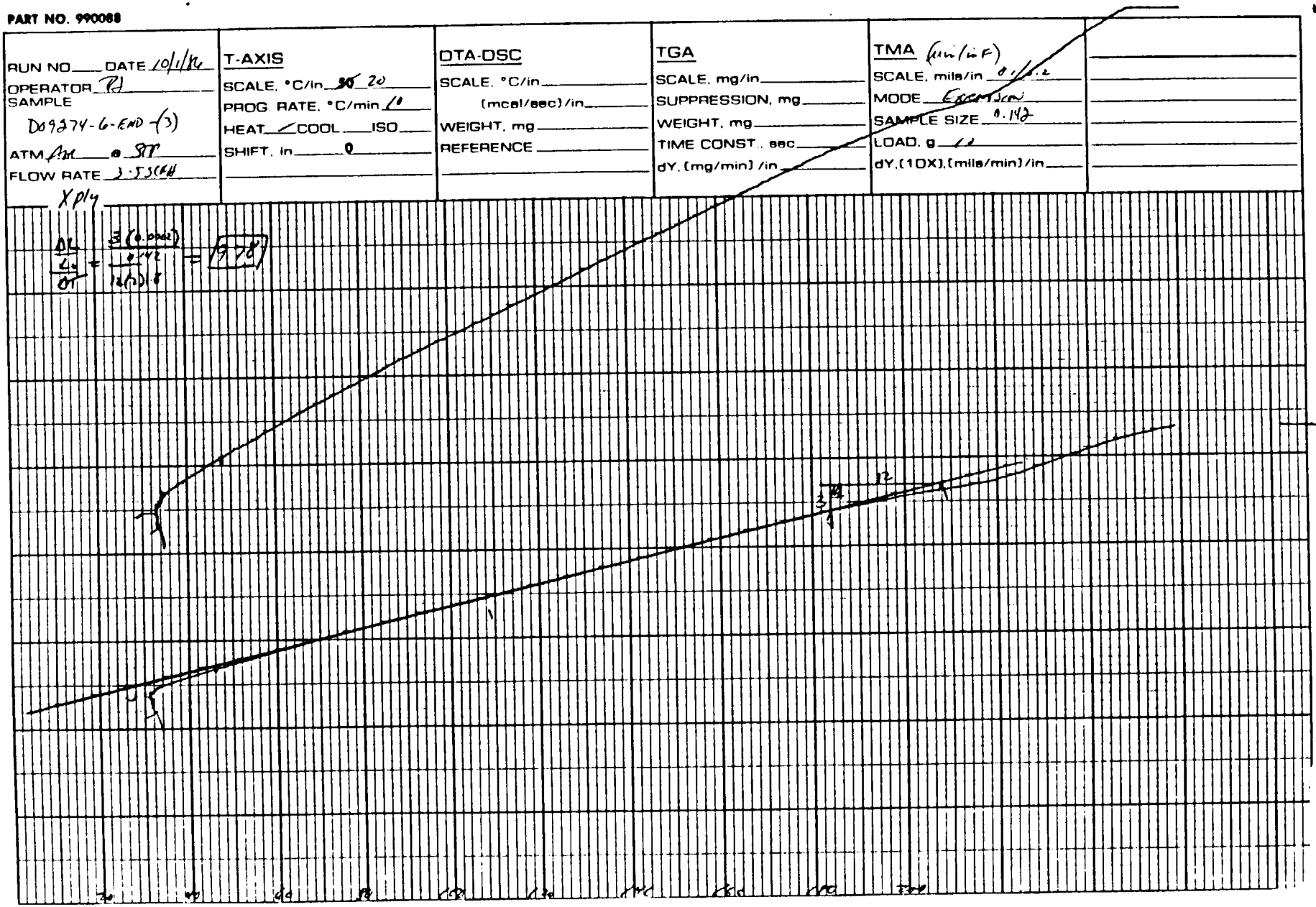
Chart 21L2

PART NO. 990088

RUN NO ___ DATE 10/1/96 OPERATOR RJ SAMPLE D9274-6-END-(3) ATM Air @ RT FLOW RATE 2.55(RH)	T-AXIS SCALE, °C/in 50 20 PROG. RATE, °C/min 10 HEAT ✓ COOL ___ ISO ___ SHIFT, in 0	DTA-DSC SCALE, °C/in ___ (mcal/sec)/in ___ WEIGHT, mg ___ REFERENCE ___	TGA SCALE, mg/in ___ SUPPRESSION, mg ___ WEIGHT, mg ___ TIME CONST., sec ___ dY, (mg/min) /in ___	TMA (μm/in F) SCALE, mils/in 0.1/0.2 MODE Expansion SAMPLE SIZE 0.142 LOAD, g 10 dY, (10X), (mils/min)/in ___	

Xply

$$\frac{\frac{\Delta L}{L_0}}{\Delta T} \div \frac{3(0.0002)}{12(5)\cdot 8} = 9.28$$



MEASURED VARIABLE

DUPONT Instruments

Chart 21L3

PART NO. 990088

RUN NO ___ DATE 10/1/96	T-AXIS	DTA-DSC	TGA	TMA (um/in F)	
OPERATOR TH	SCALE, °C/in 50 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE	PROG RATE, °C/min 20	(mcal/sec)/in	SUPPRESSION, mg	MODE EXPANSION	
D0937N-6-END (4)	HEAT ✓ COOL ISO	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.143	
ATM Air @ 500	SHIFT, In 0	REFERENCE	TIME CONST, sec	LOAD, g 20	
FLOW RATE 3-5SCFM			dY, (mg/min) /In	dY, (10X), (mils/min) /In	

XP/4

$$\frac{\Delta T}{\Delta t} = \frac{4(6.000)}{\frac{0.143}{20}(2)(1.8)} = 77.90$$

DUPONT Instruments

MEASURED VARIABLE

Chart 2114

Chart 21M1

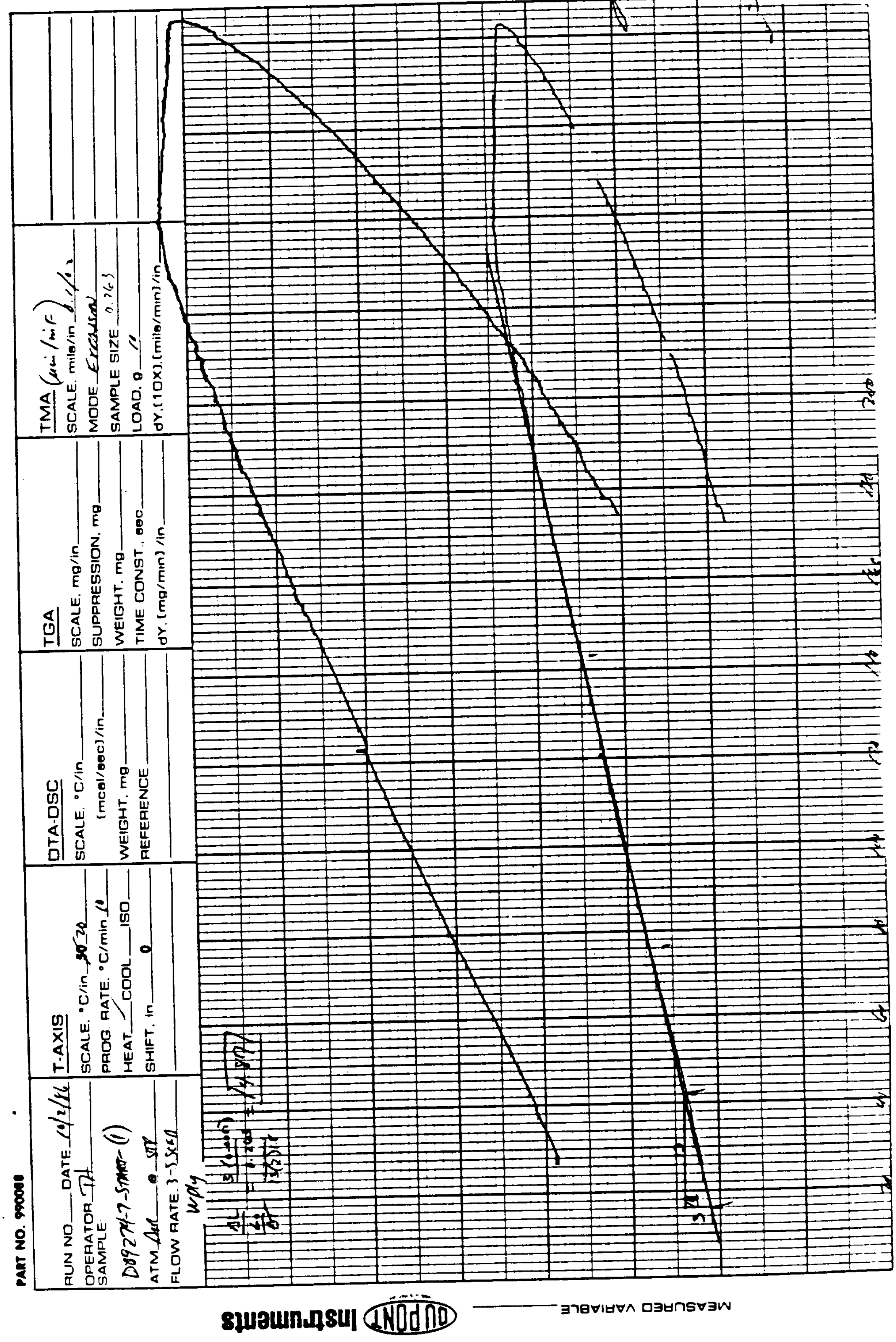

PART NO. 990088
RUN NO
DATE
OPERATOR
SAMPLE
ATM
FLOW RATE
T-AXIS
SCALE, °C/in
PROG. RATE, °C/min
HEAT
COOL
ISO
SHIFT, in
DTA-DSC
SCALE, °C/in
(mcal/sec)/in
WEIGHT, mg
REFERENCE
TGA
SCALE, mg/in
SUPPRESSION, mg
WEIGHT, mg
TIME CONST., sec
dY, (mg/min)/in
TMA
SCALE, mils/in
MODE
SAMPLE SIZE
LOAD, g
dY, (10X), (mils/min)/in
DUPONT Instruments
MEASURED VARIABLE

Chart 21M2

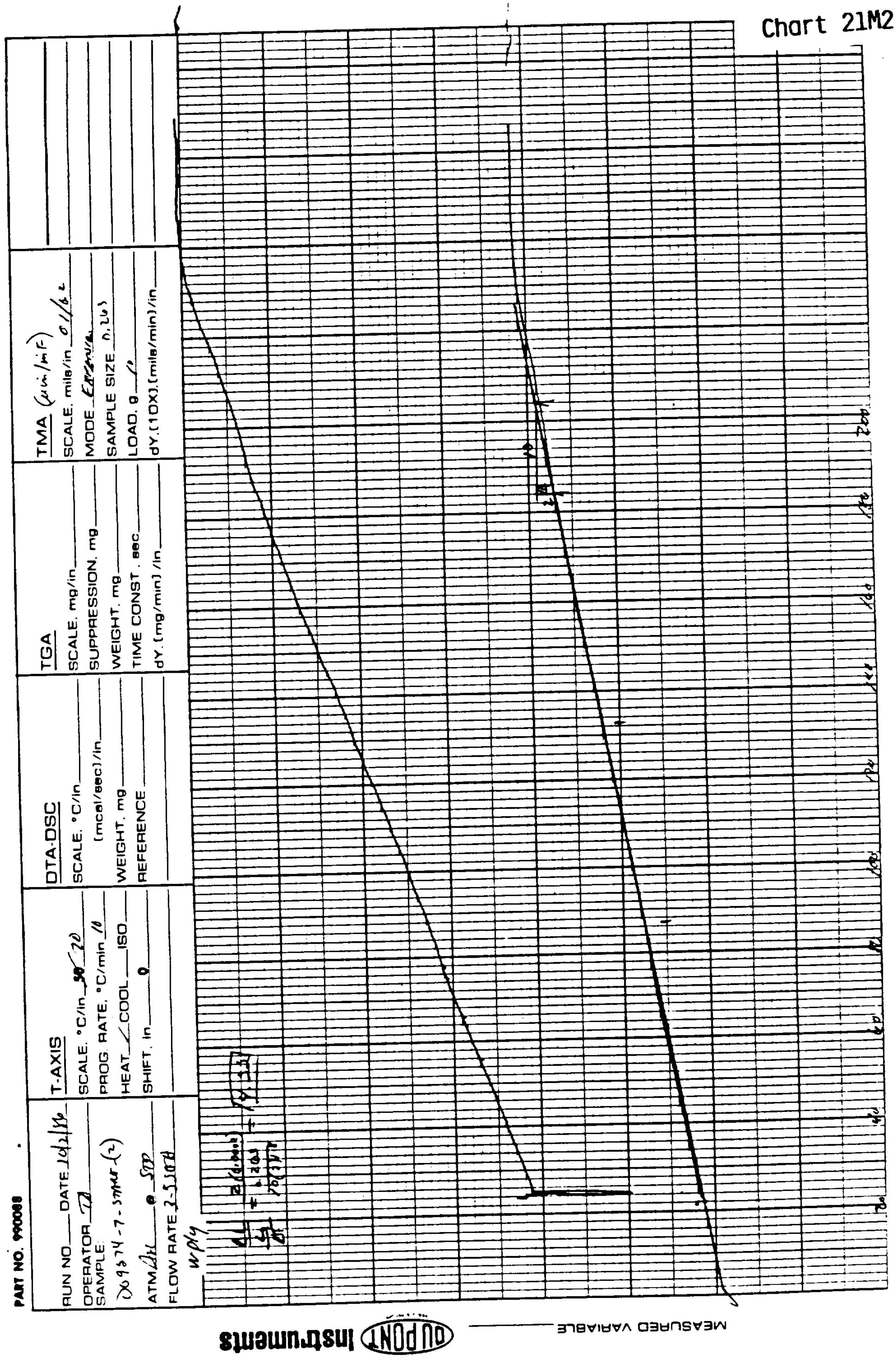


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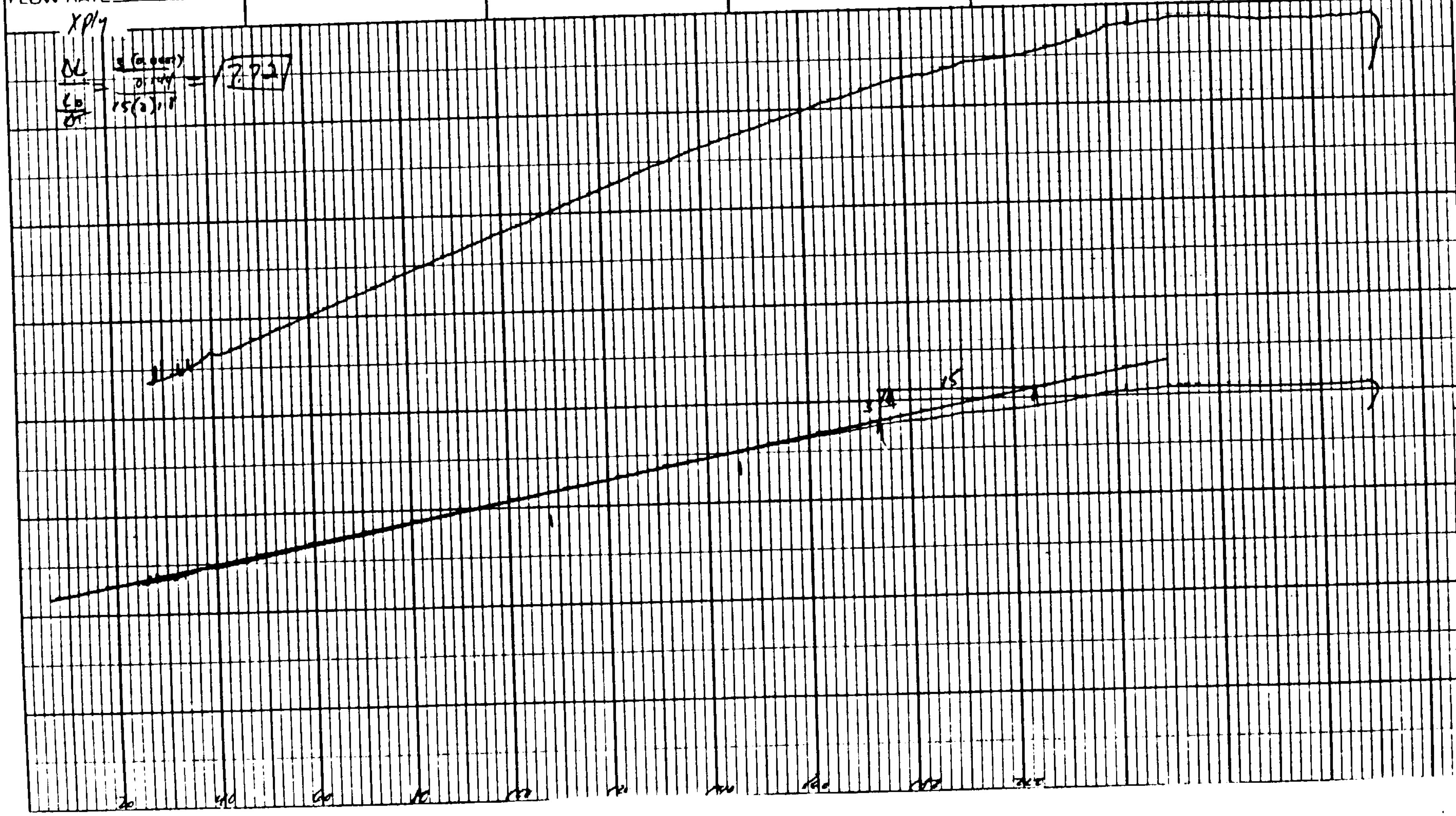
Chart 21M3

PART NO. 990088

	T-AXIS	DTA-DSC	TGA	TMA (in/in°F)	
RUN NO.___ DATE 10/1/84	SCALE, °C/in 20	SCALE, °C/in___	SCALE, mg/in___	SCALE, mils/in 0.1/0.2	
OPERATOR D'	PROG. RATE, °C/min 10	(mcal/sec)/in___	SUPPRESSION, mg___	MODE Expansion	
SAMPLE: D09374-7-START-(3)	HEAT ✓ COOL___ ISO___	WEIGHT, mg___	WEIGHT, mg___	SAMPLE SIZE 0.144	
ATM Air @ STP	SHIFT, in 0	REFERENCE___	TIME CONST., sec___	LOAD, g 10	
FLOW RATE 2.5 SCFH			dY, (mg/min)/in___	dY, (10X), (mils/min)/in___	



DUPONT Instruments

MEASURED VARIABLE

PART NO. 990088

RUN NO ___ DATE 10/1/96	T-AXIS	DTA-DSC	TGA	TMA (µm/in F)	
OPERATOR ___	SCALE, °C/in 50/20	SCALE, °C/in ___	SCALE, mg/in ___	SCALE, mils/in 0.1/0.2	
SAMPLE	PROG. RATE, °C/min 10	(mcal/sec)/in ___	SUPPRESSION, mg ___	MODE Expansion	
D9574-7-start-(4)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg ___	WEIGHT, mg ___	SAMPLE SIZE 0.142	
ATM Air @ STP	SHIFT, in 0	REFERENCE ___	TIME CONST., sec ___	LOAD, g 10	
FLOW RATE 3-5 scfh			dY, (mg/min) /in ___	dY, (10X), (mils/min) /in ___	
XPly.					

$\frac{dL}{dt} = \frac{5(0.2)}{0.142} = 18.5$

MEASURED VARIABLE ___

DUPONT Instruments

Chart 21M4

Chart 21N2

PART NO. 990068

RUN NO ___ DATE 10/2/96
OPERATOR PH
SAMPLE
D01271-7-Exo-(3)
ATM Air @ STP
FLOW RATE 3-5SCFH
w/p/y

T-AXIS
SCALE, °C/in 50 20
PROG. RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in ___ 0 ___

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST., sec ___
dY/dT (mg/min)/in ___

TMA (μm/mF)
SCALE, mils/in 0.1/0.4
MODE Expans
SAMPLE SIZE 5-250
LOAD, g 10
dY/dT (10X) (mils/min)/in ___

DUPONT Instruments

MEASURED VARIABLE

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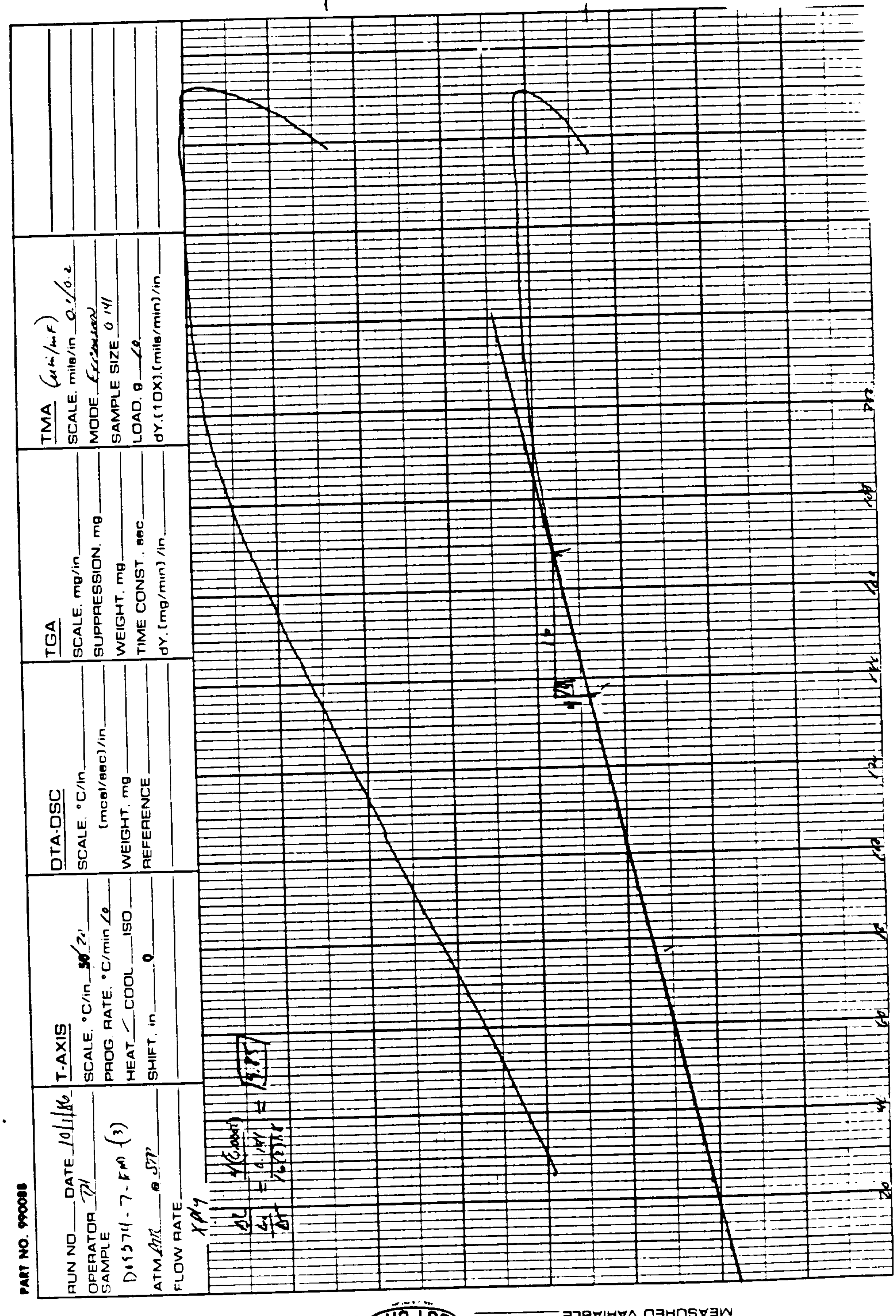

Chart 21N4

PART NO. 990088

RUN NO ___ DATE 10/11/94
OPERATOR TH
SAMPLE
D6534-7-END-(1)
ATM Air @ STP
FLOW RATE 3.5 [illegible]
X pb/y

T-AXIS
SCALE, °C/in 50 20
PROG RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST, sec ___
dY, (mg/min)/in ___

TMA (mm/mF)
SCALE, mils/in 0.1/10.2
MODE Penetration
SAMPLE SIZE 0.142
LOAD, g 1
dY, (10X), (mils/min)/in ___

MEASURED VARIABLE

DUPONT instruments

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Chart 2101

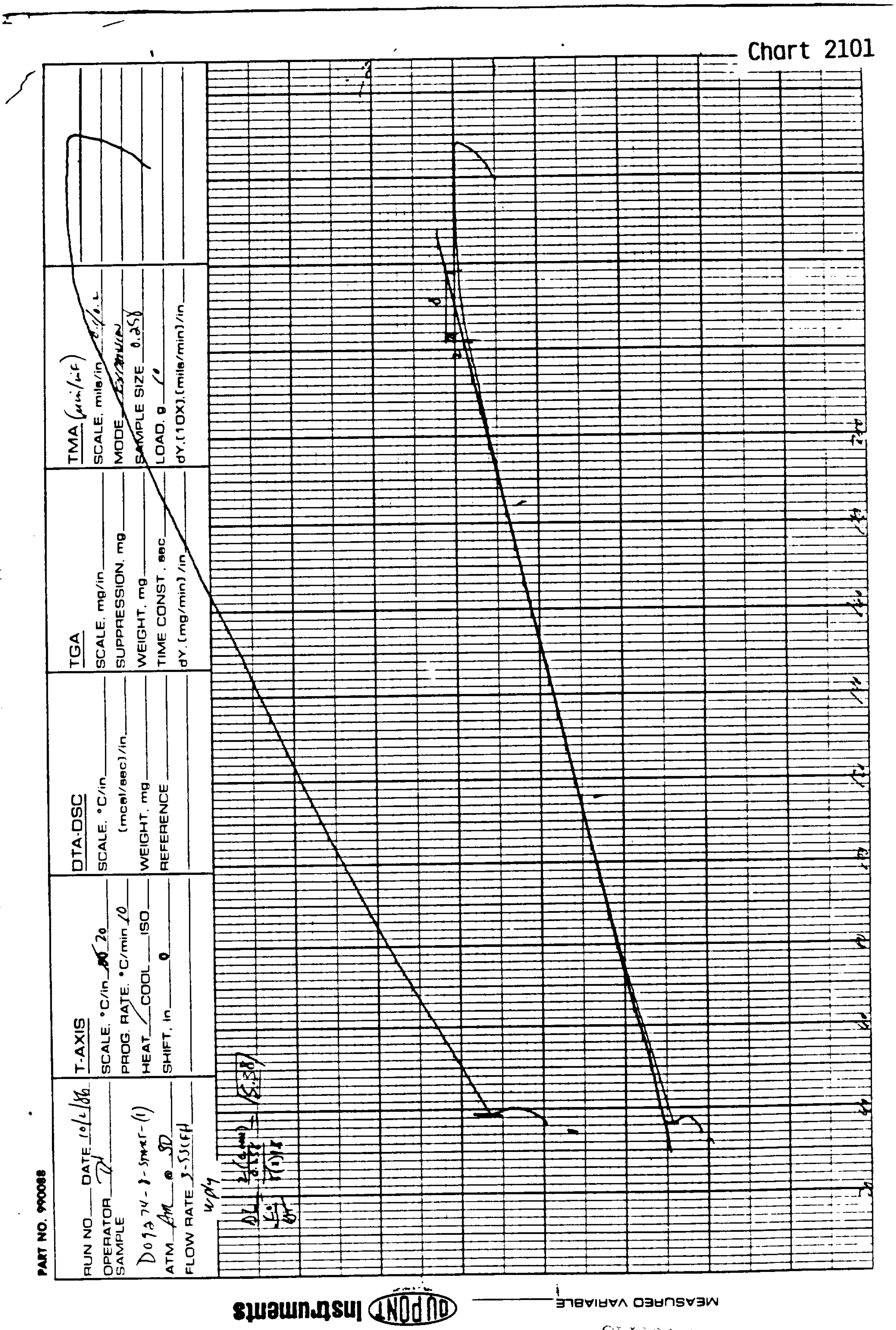

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Chart 2102

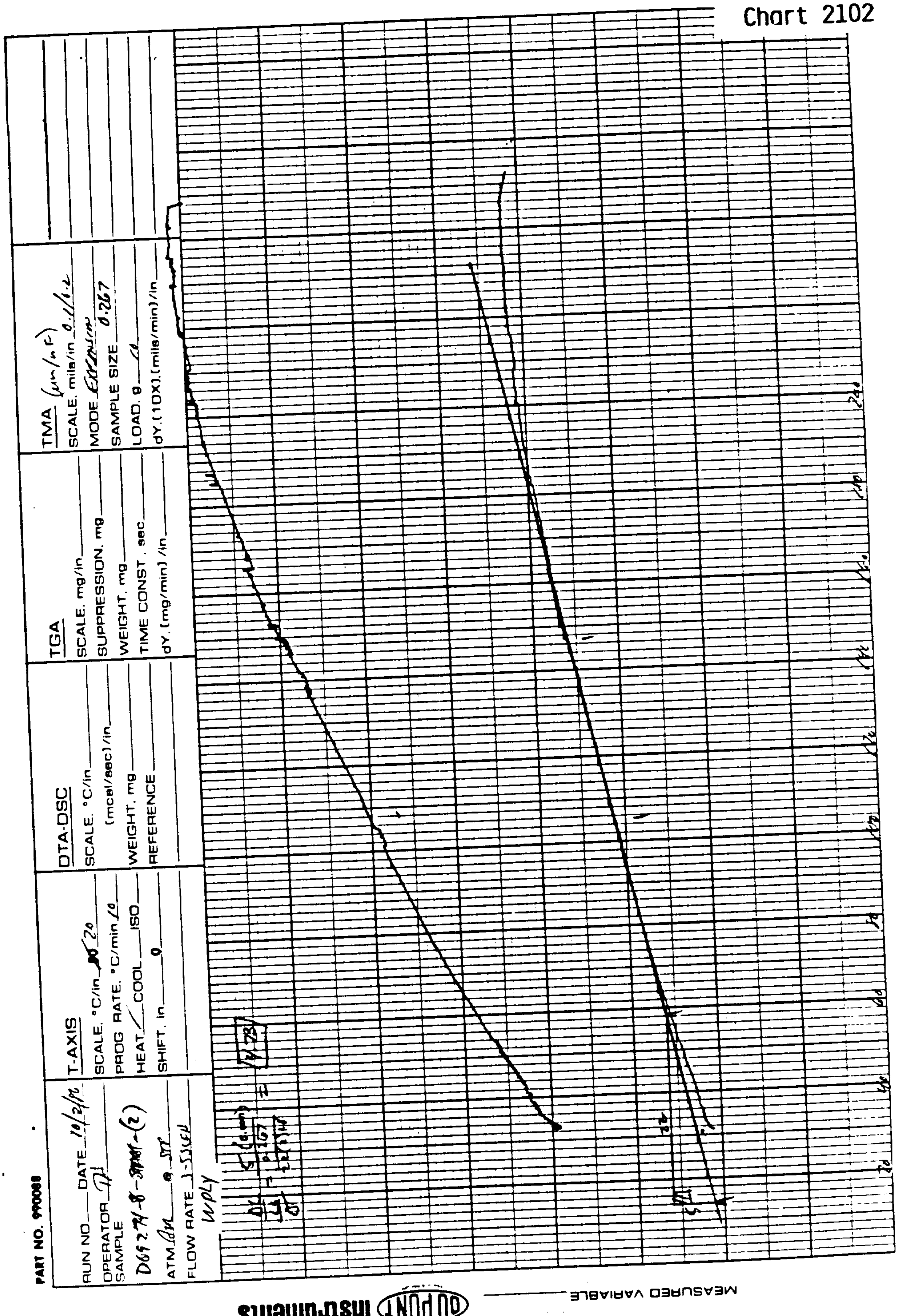

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Chart 2103

PART NO. 990088

RUN NO. ____ DATE 10/2/14

OPERATOR DJ

SAMPLE

DSC 374 - 8 - START - (B)

ATM. Air @ 50

FLOW RATE 3-50CFM

T-AXIS

SCALE, °C/in 50 20

PROG RATE, °C/min 10

HEAT ____ COOL ____ ISO ____

SHIFT, in 0

DTA-DSC

SCALE, °C/in ____

(mcal/sec)/in ____

WEIGHT, mg ____

REFERENCE ____

TGA

SCALE, mg/in ____

SUPPRESSION, mg ____

WEIGHT, mg ____

TIME CONST., sec ____

dY/(mg/min)/in ____

TMA (μin/in F)

SCALE, mils/in 0.1/0.2

MODE Expansion

SAMPLE SIZE 0.145

LOAD, g 10

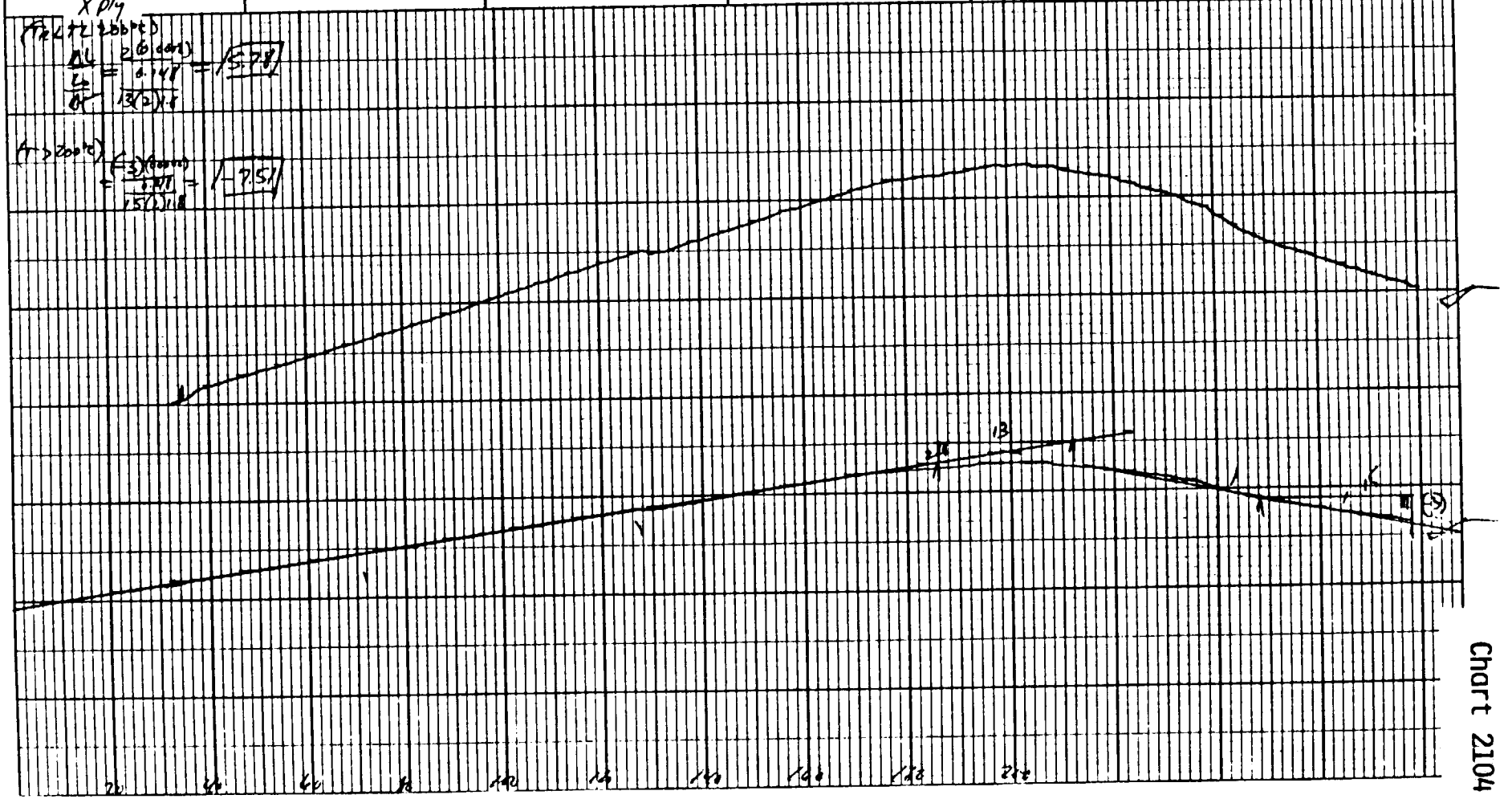
dY/(10X)/(mils/min)/in ____

MEASURED VARIABLE ____

DUPONT instruments

PART NO. 990088

RUN NO. ___ DATE 10/2/86	T-AXIS	DTA-DSC	TGA	TMA (μm/in F)	
OPERATOR TH	SCALE, °C/in 50 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
1) 09274-8-SPART-(4)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.148	
ATM Air @ STP	SHIFT, in 0	REFERENCE	TIME CONST., sec	LOAD, g 10	
FLOW RATE 3-5 SCFM			dY, (mg/min) /in	dY, (10X), (mils/min)/in	



DUPONT Instruments

MEASURED VARIABLE

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Chart 2104

PART NO. 990068

RUN NO ___ DATE 10/3/06 OPERATOR TD SAMPLE D07374-8-END-(1) ATM Air @ STP FLOW RATE 75SCCM	T-AXIS SCALE, °C/in 50 20 PROG RATE, °C/min 10 HEAT ✓ COOL ___ ISO ___ SHIFT, in 0	DTA-DSC SCALE, °C/in ___ (mcal/sec)/in ___ WEIGHT, mg ___ REFERENCE ___	TGA SCALE, mg/in ___ SUPPRESSION, mg ___ WEIGHT, mg ___ TIME CONST, sec ___ dY, (mg/min)/in ___	TMA (air/N2) SCALE, mils/in 0.1/0.1 MODE Expan+Xon SAMPLE SIZE 0.261 LOAD, g 10 dY, (10X), (mils/min)/in ___	___ ___ ___ ___ ___ ___

w/ply

$\frac{\Delta L}{L_0} = \frac{66 \text{ mils}}{0.261} = 1414\%$

$\frac{\Delta L}{L_0} = \frac{\Delta L}{50(2)(.5)}$

DUPONT Instruments

MEASURED VARIABLE ___

Chart 21P1

Chart 21P2

PART NO. 990088

RUN NO ___ DATE 10/12/92
OPERATOR TD
SAMPLE
D0593 74 - 8 - END - (2)
ATM Air @ STP
FLOW RATE 2 SCFH

T-AXIS
SCALE, °C/in 50 20
PROG RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST., sec ___
dY/dT (mg/min)/in ___

TMA (μm/in)
SCALE, mils/in 0.1/0.2
MODE Expansion
SAMPLE SIZE 0.265
LOAD, g 10
dY/dT (10X) (mils/min)/in ___

MEASURED VARIABLE

DUPONT Instruments

PART NO. 990088

RUN NO ___ DATE 10/2/86	T-AXIS	DTA-DSC	TGA	TMA (mm/hr)	
OPERATOR TH	SCALE, °C/in 50 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0 1/1.2	
SAMPLE:	PROG RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
Do 9274-8-(ND)-(3)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.196	
ATM Air @ STP	SHIFT, in 0	REFERENCE	TIME CONST, sec	LOAD, g 10	
FLOW RATE 3-5 SCFH			dY, (mg/min) /in	dY, (10X), (mils/min) /in	

XPly

$\left(\frac{\Delta V}{2\alpha\,\Delta T}\right)^2 = \frac{3(0.6004)}{0.196} = 18.15$

$(T > 196°C)$ $\frac{(-2)(0.6004)}{2\alpha(2)} = \frac{0.196}{2\alpha(2)} = -14.4$

Chart 21P4

PART NO. 990068

RUN NO. ___ DATE 10/12/87

OPERATOR RH

SAMPLE

1D 497-P-6MD-(4)

ATM Air @ SCF

FLOW RATE 3-5 SCFM

XPD

T-AXIS

SCALE, °C/in 50 20

PROG. RATE, °C/min 10

HEAT ✓ COOL ___ ISO ___

SHIFT, in 0

DTA-DSC

SCALE, °C/in ___

(mcal/sec)/in ___

WEIGHT, mg ___

REFERENCE ___

TGA

SCALE, mg/in ___

SUPPRESSION, mg ___

WEIGHT, mg ___

TIME CONST., sec ___

dY/(mg/min)/in ___

TMA (air/1°F)

SCALE, mils/in 0.1/0.2

MODE Expansion

SAMPLE SIZE 0.145

LOAD, g 10

dY/(10X)/(mils/min)/in ___

MEASURED VARIABLE

DUPONT Instruments

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Chart 21Q1

PART NO. 990088

RUN NO ___ DATE 2/20/91
OPERATOR TH
SAMPLE
Do9274-5-END-(1)
ATM Atm @ STP
FLOW RATE 1-System
apply

T-AXIS
SCALE, °C/in 50/20
PROG. RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST., sec ___
dY/dT (mg/min)/in ___

TMA (μm/in)
SCALE, mils/in 5/0.5
MODE Expansion
SAMPLE SIZE 0.259
LOAD, g 10
dY/dT (10X) (mils/min)/in ___

MEASURED VARIABLE

DU PONT instruments

Chart 21Q2

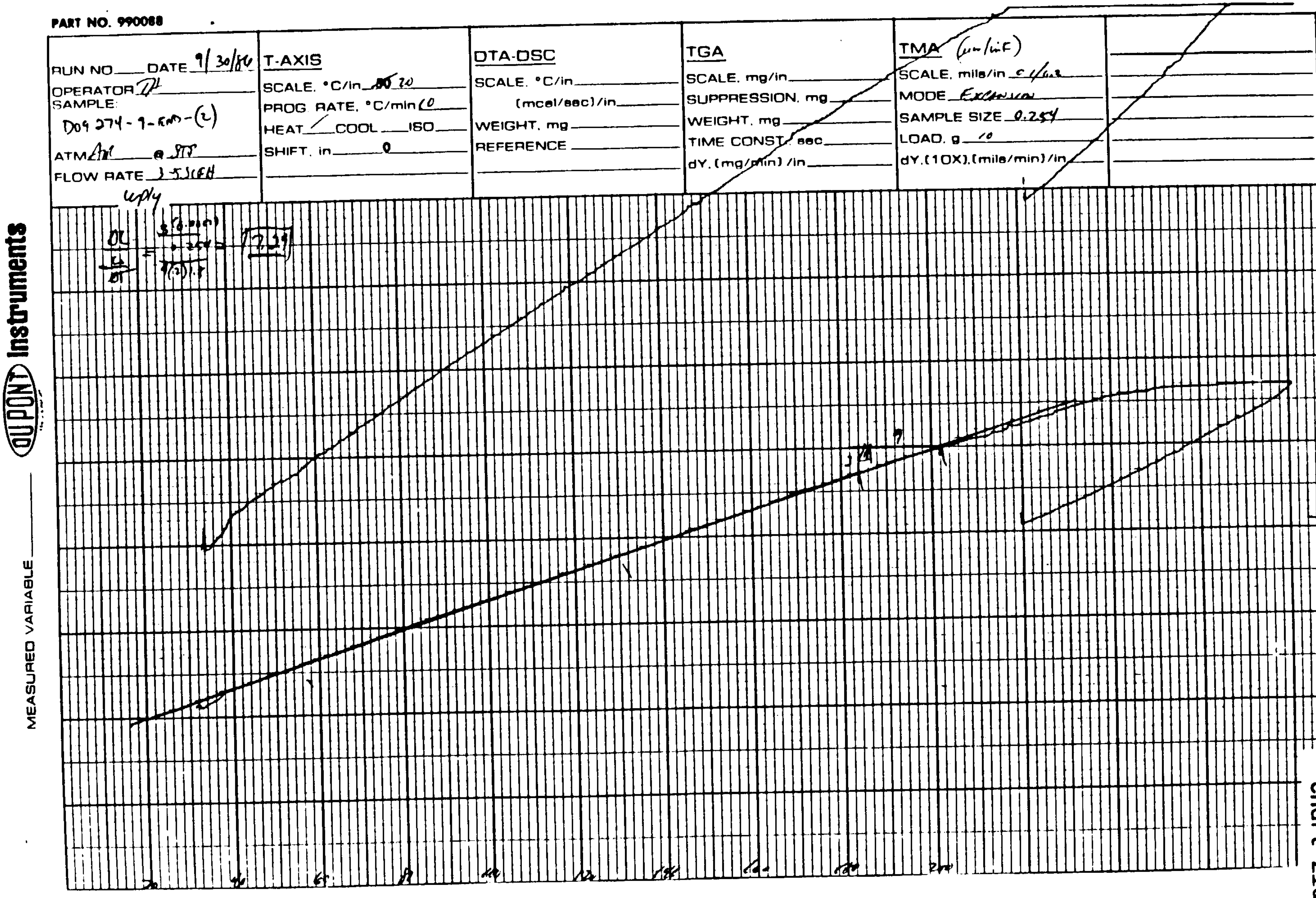

Chart 2103

PART NO. 990088

RUN NO ___ DATE 9/12/14
OPERATOR RH
SAMPLE
D4934-9-EW0-(3)
ATM Air @ RT
FLOW RATE 3-5 µm

T-AXIS
SCALE, °C/in 50 20
PROG RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST., sec ___
dY/dT (mg/min)/in ___

TMA (µm/in)
SCALE, mils/in 0.1/0.2
MODE Expansion
SAMPLE SIZE 8.146
LOAD, g 10
dY/dT (10X) (mils/min)/in ___

MEASURED VARIABLE

DUPONT Instruments

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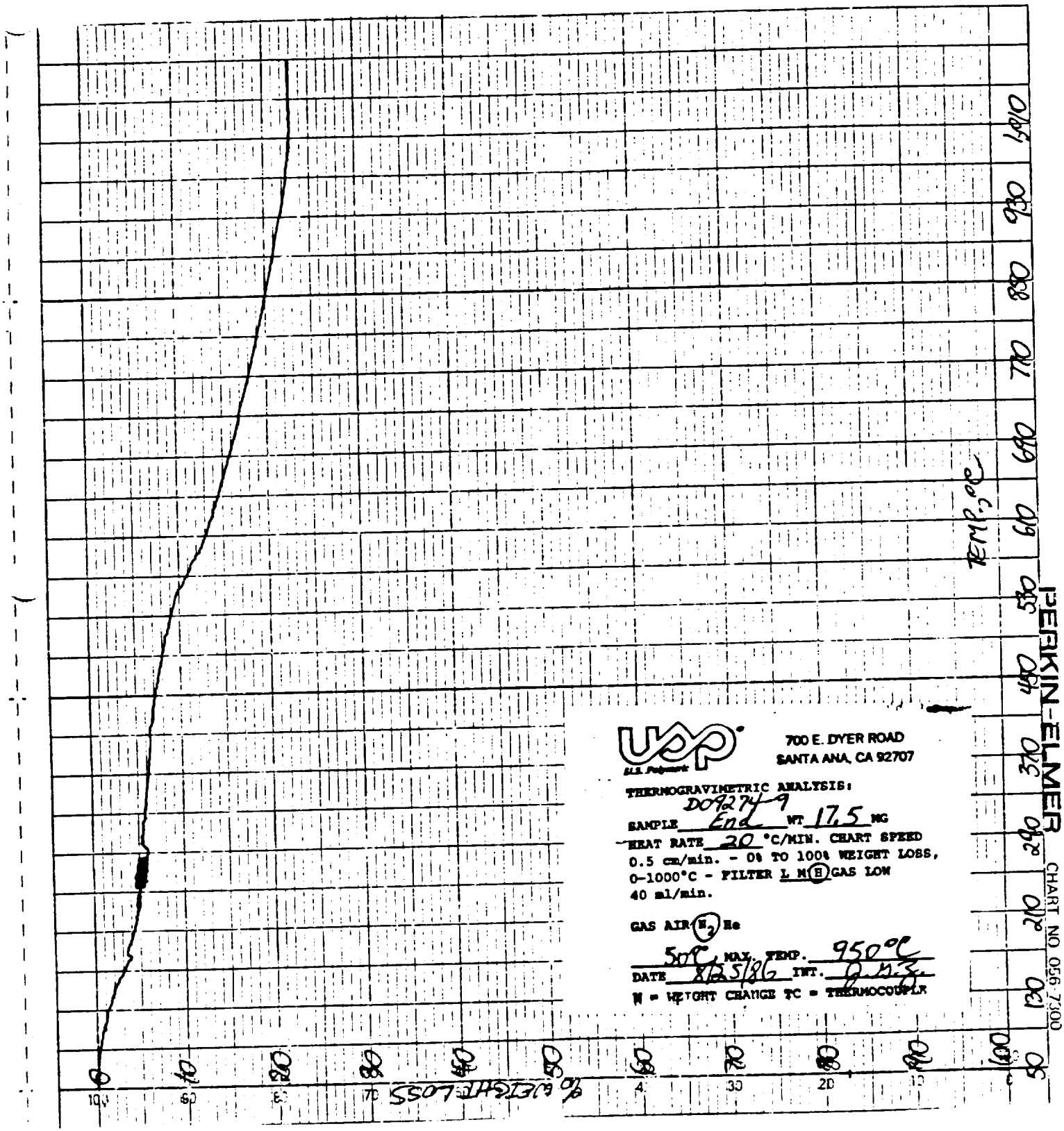

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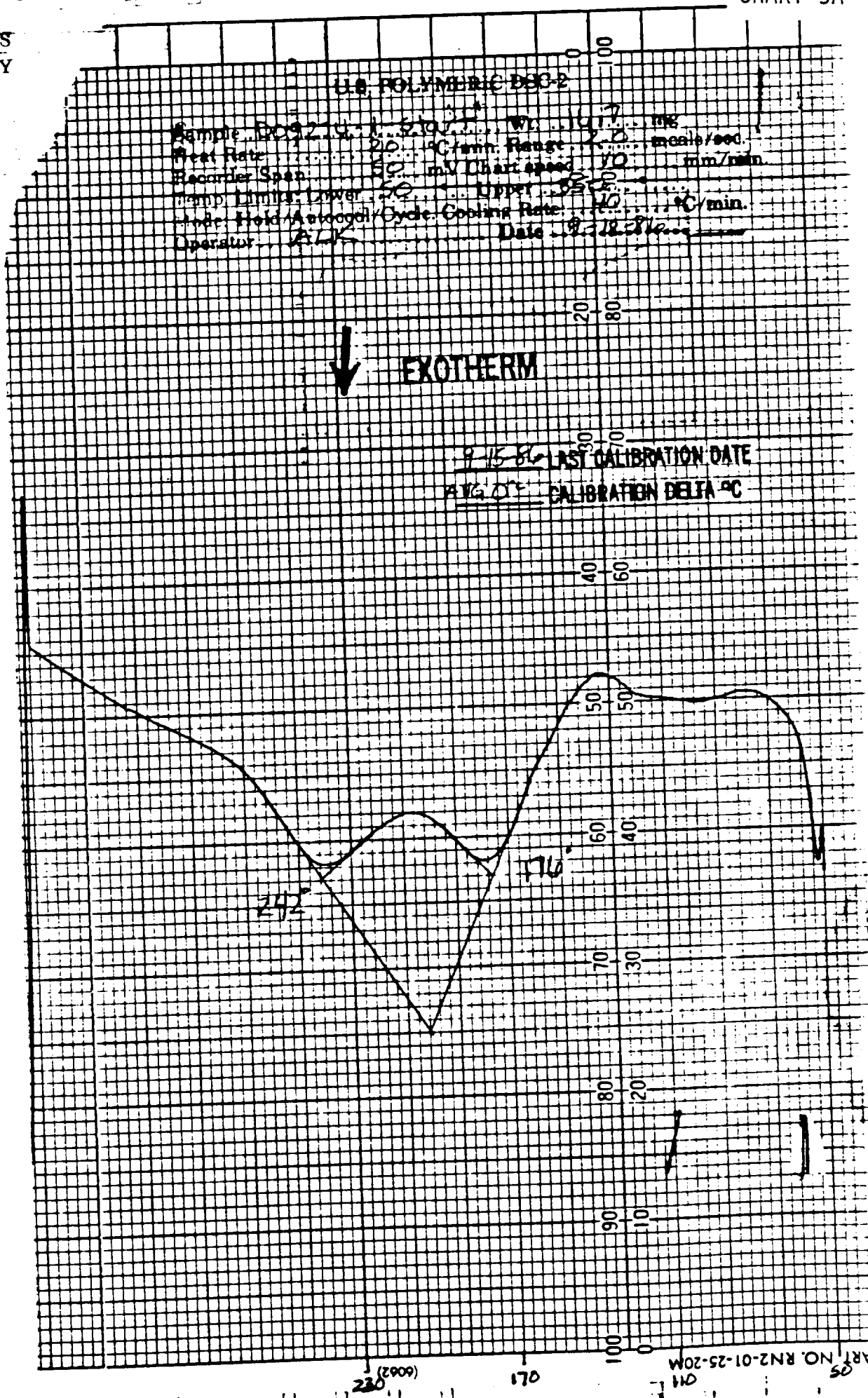
CHART 9A



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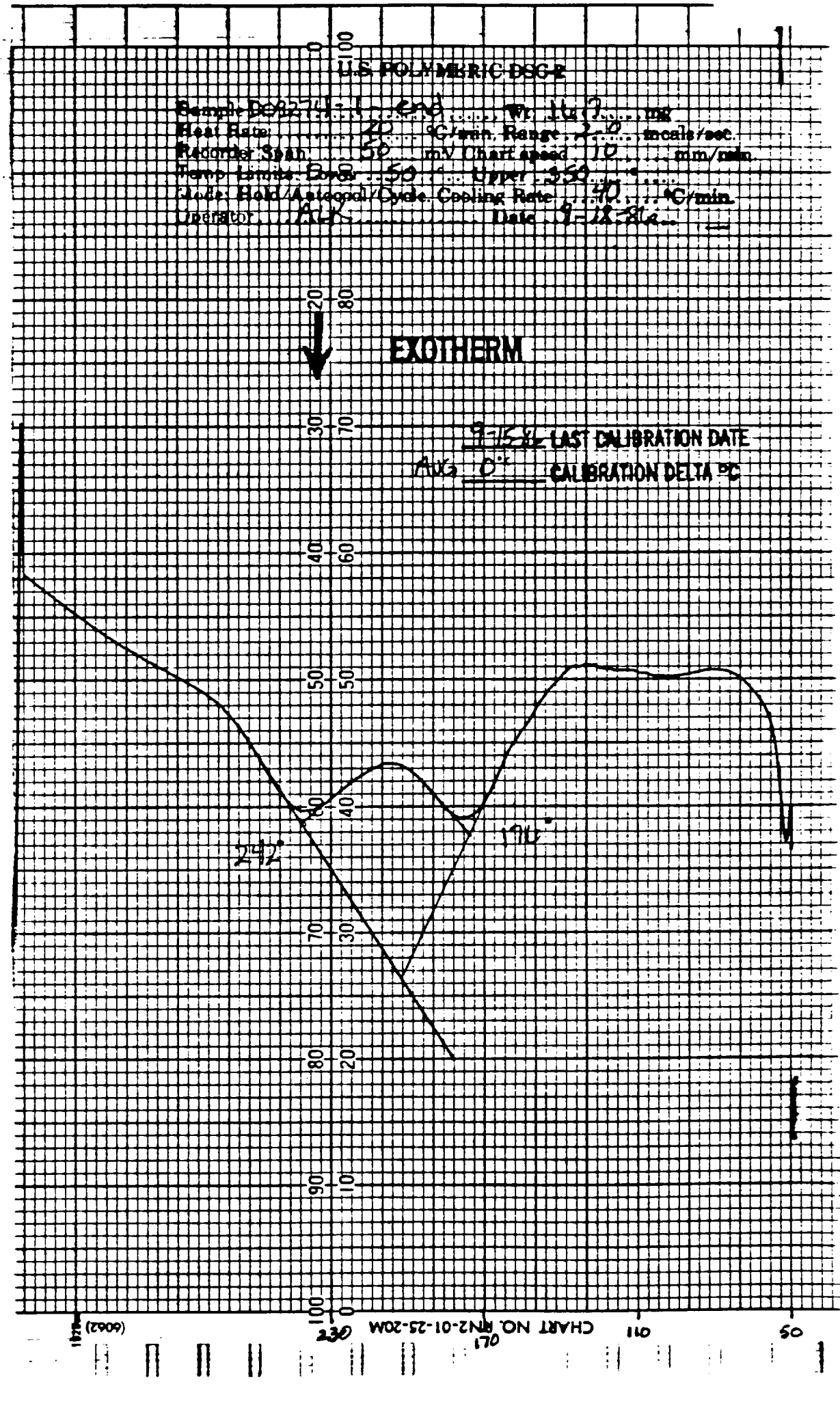

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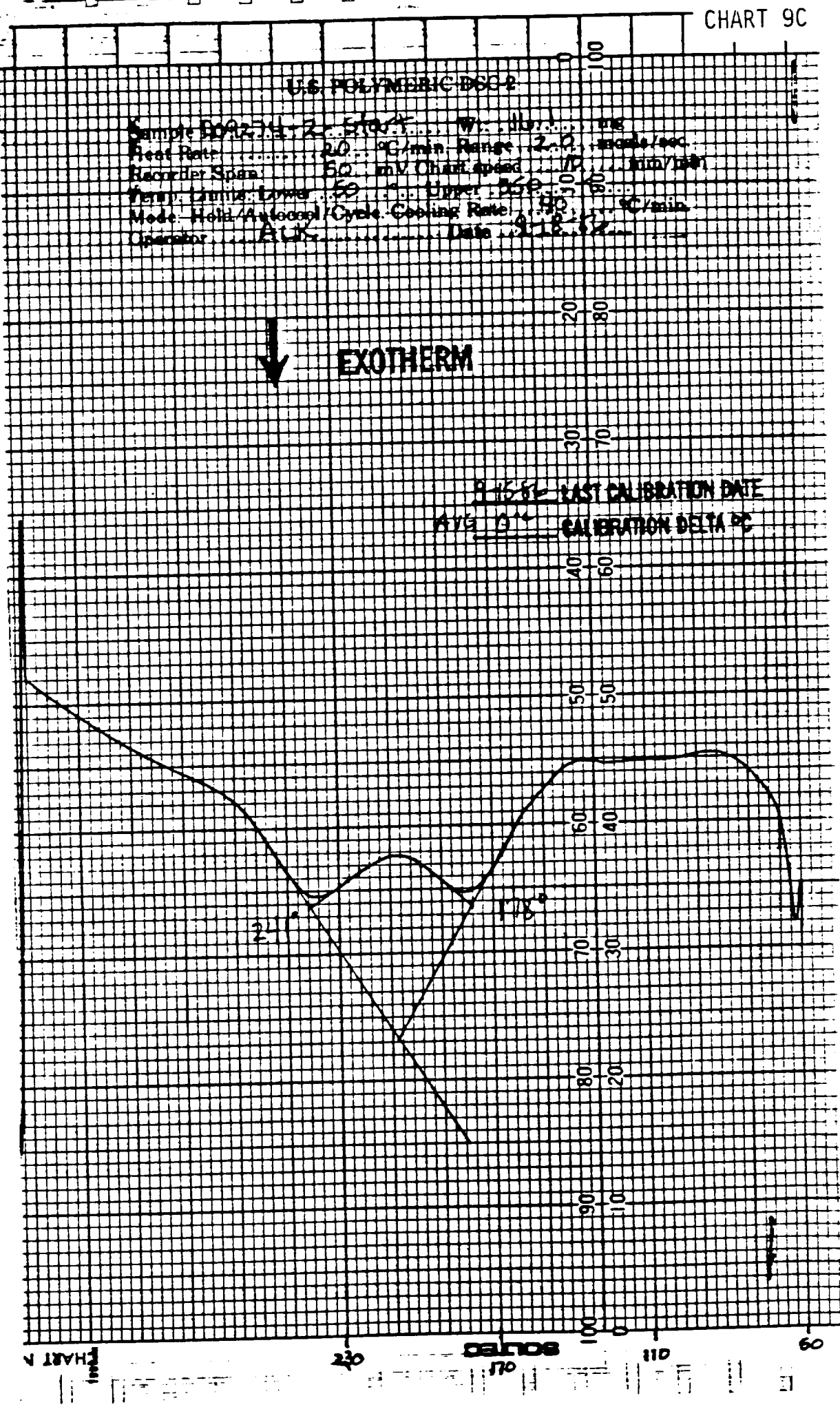

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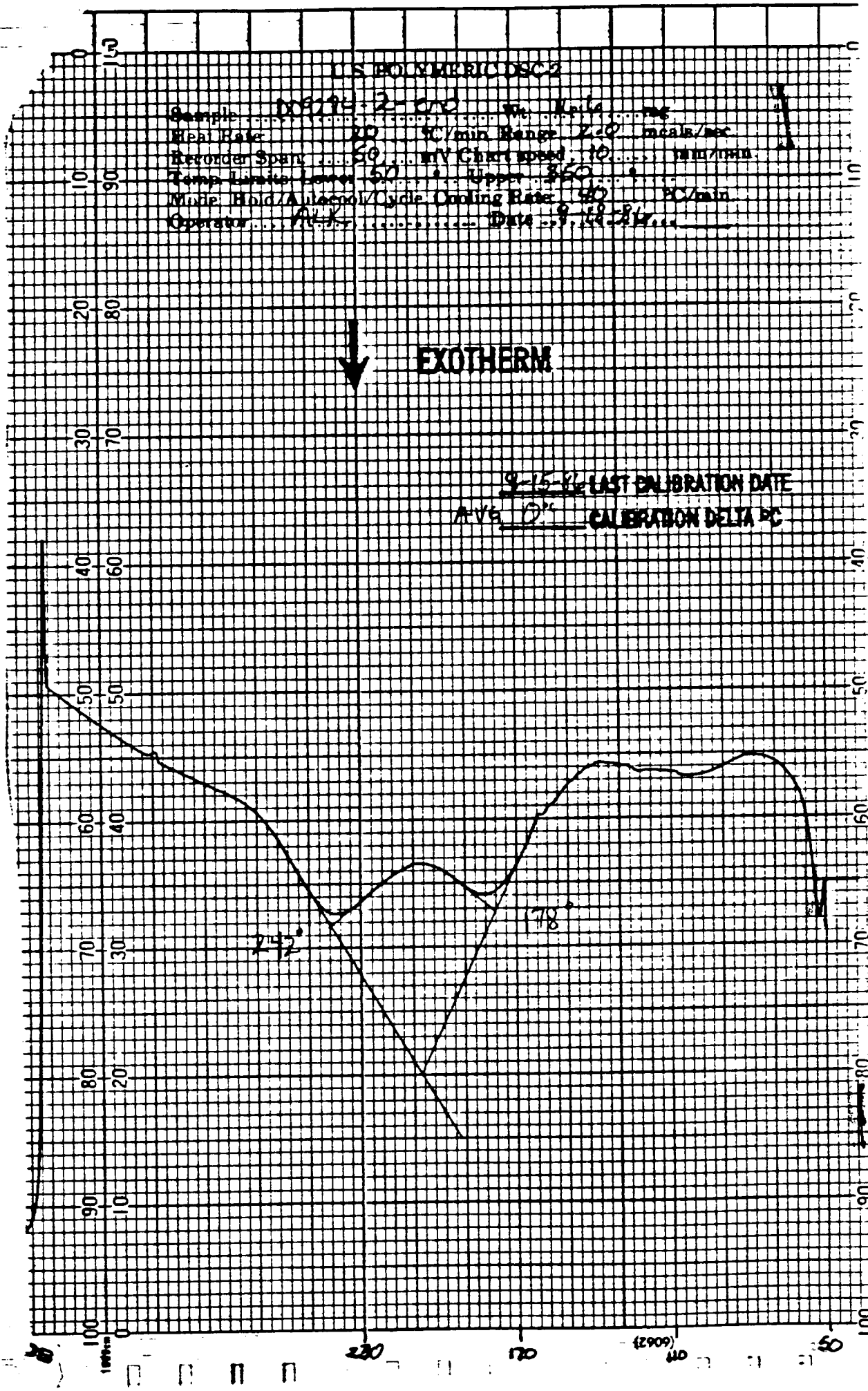

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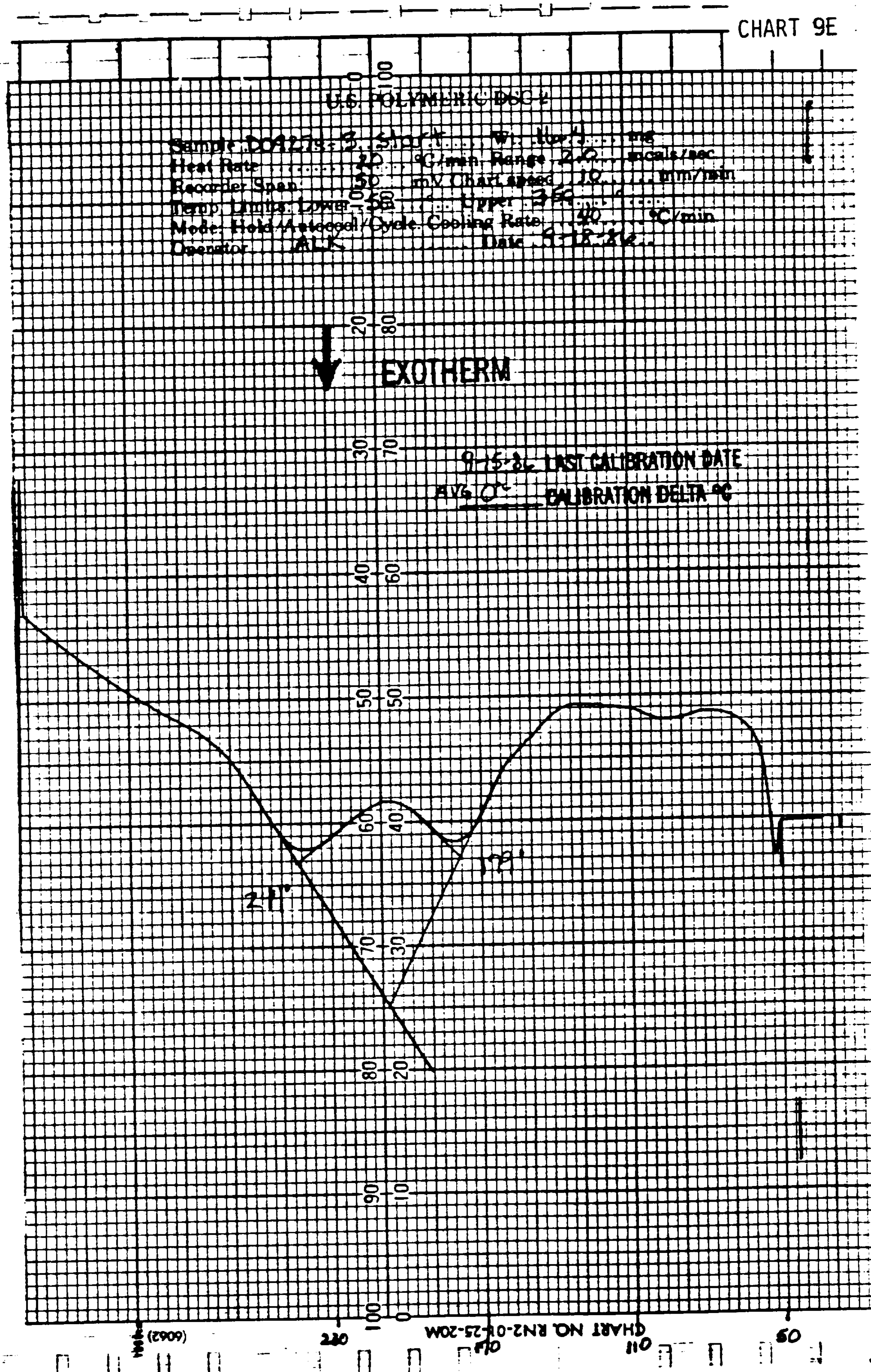

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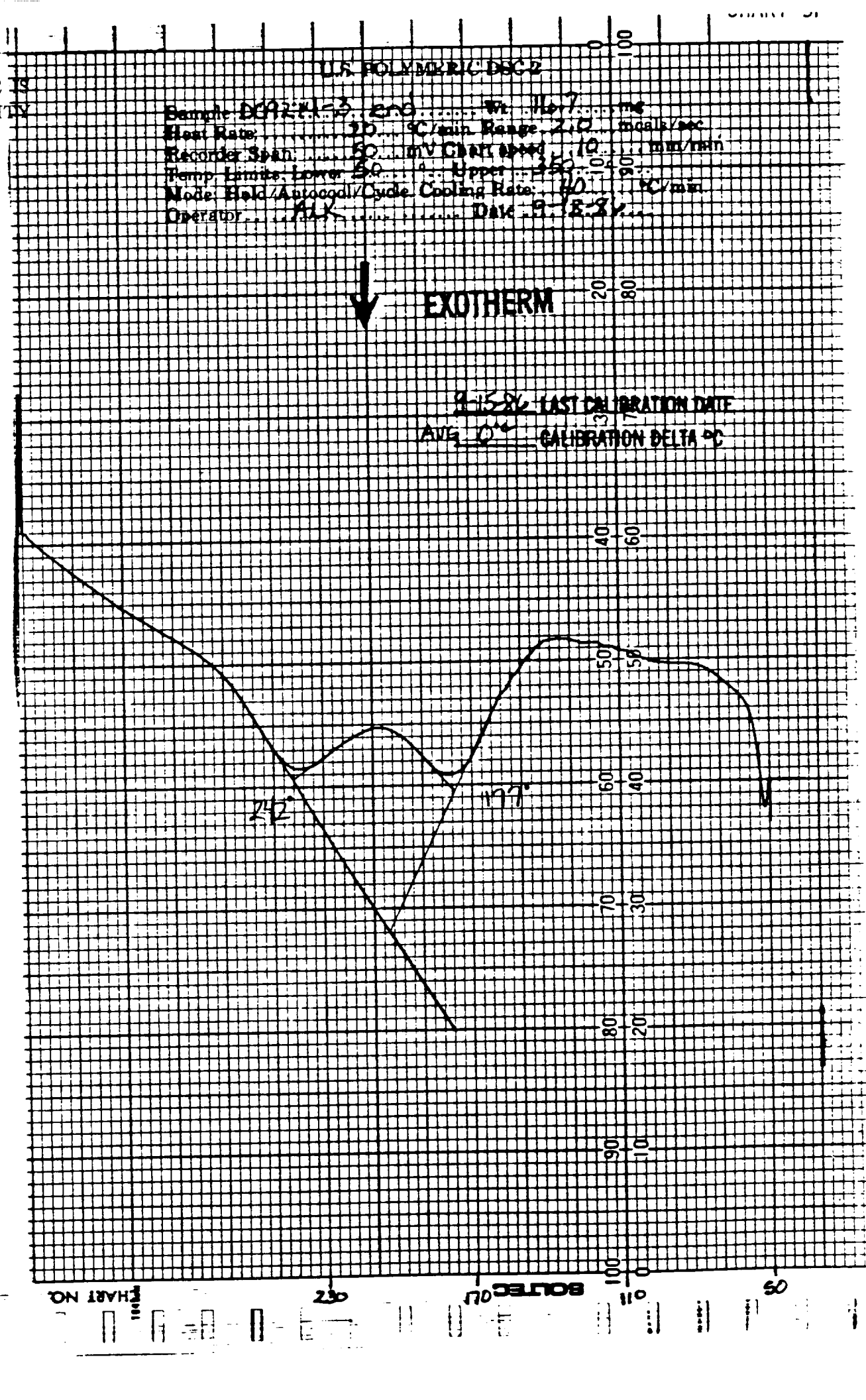

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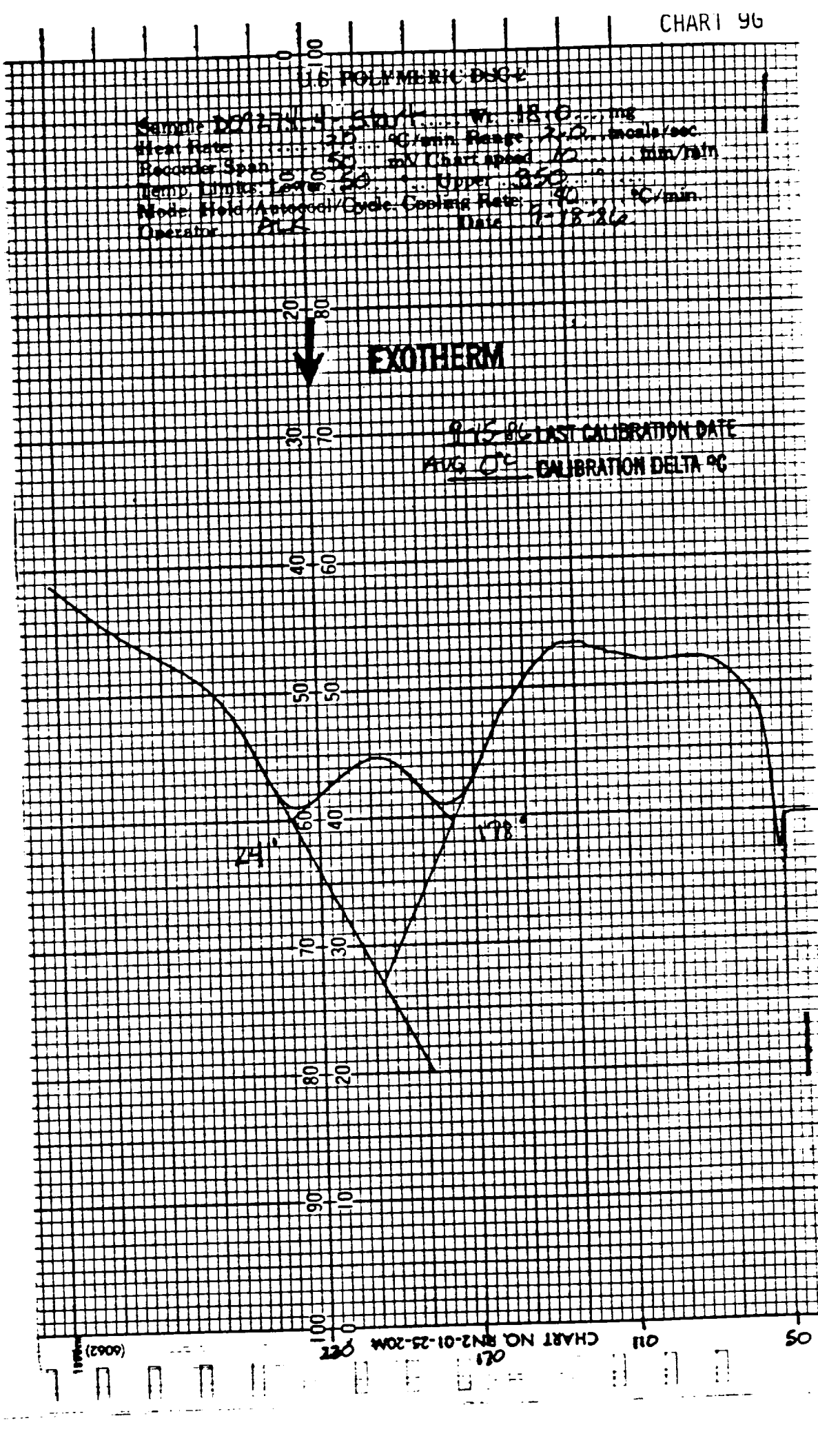

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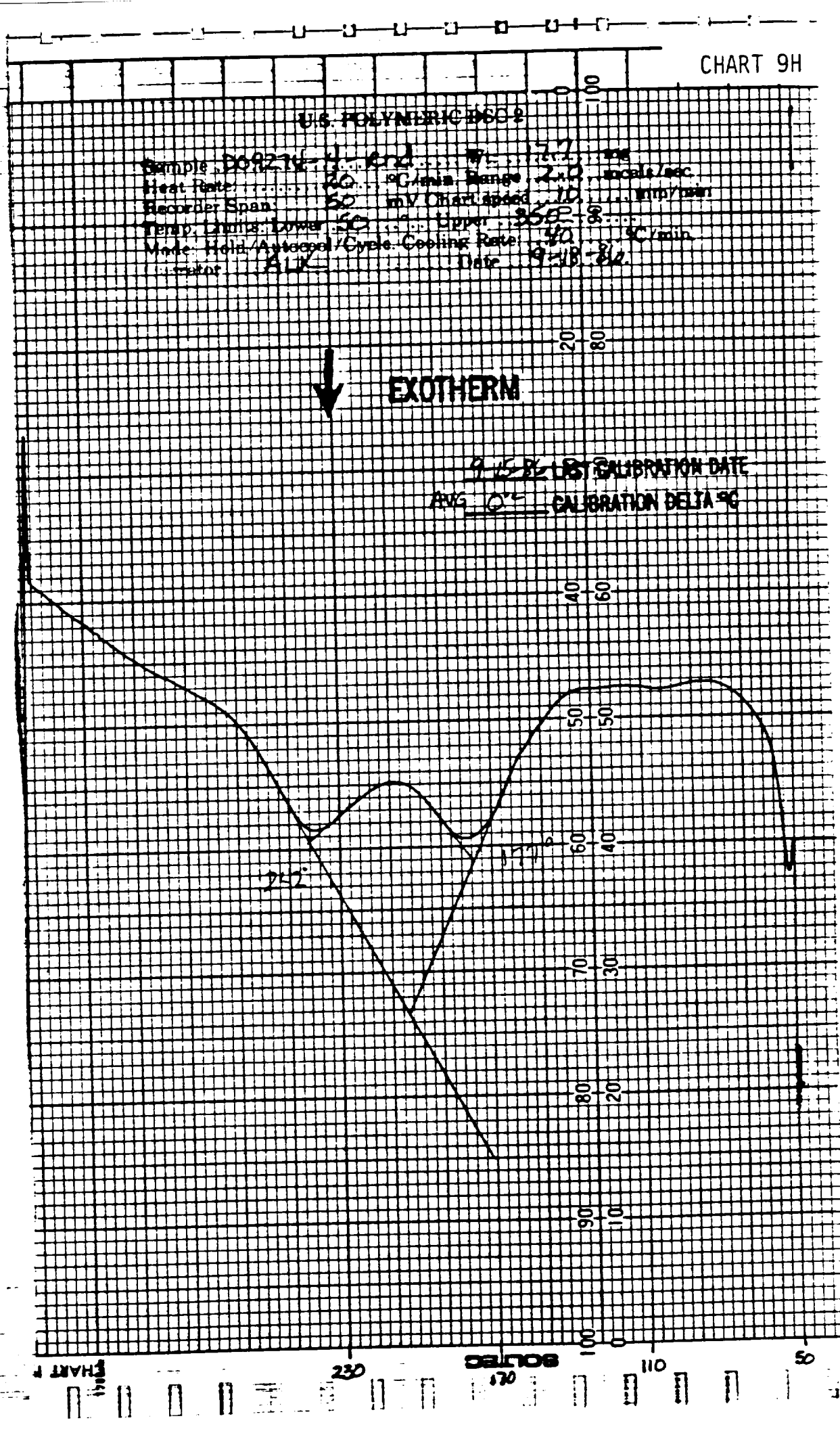

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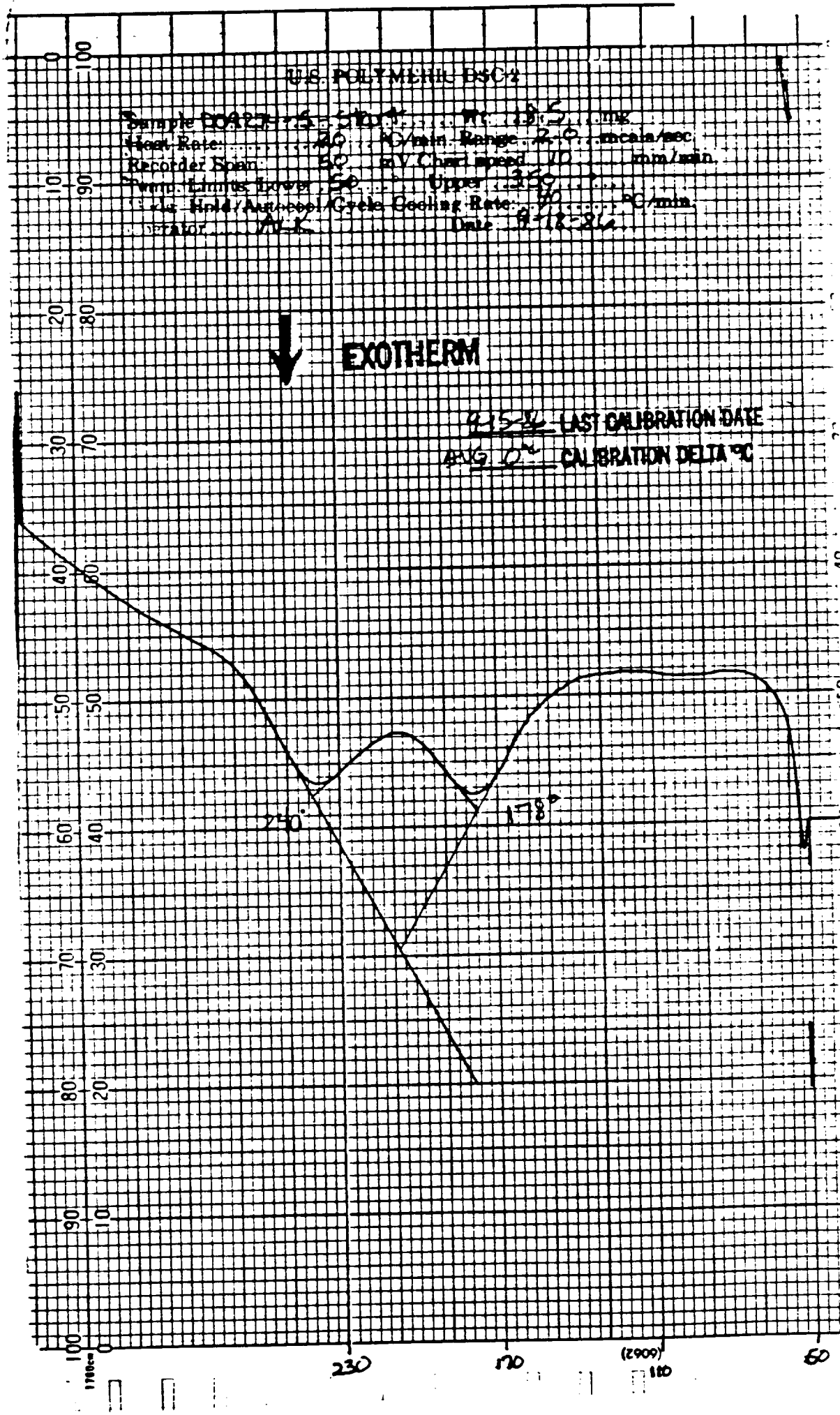

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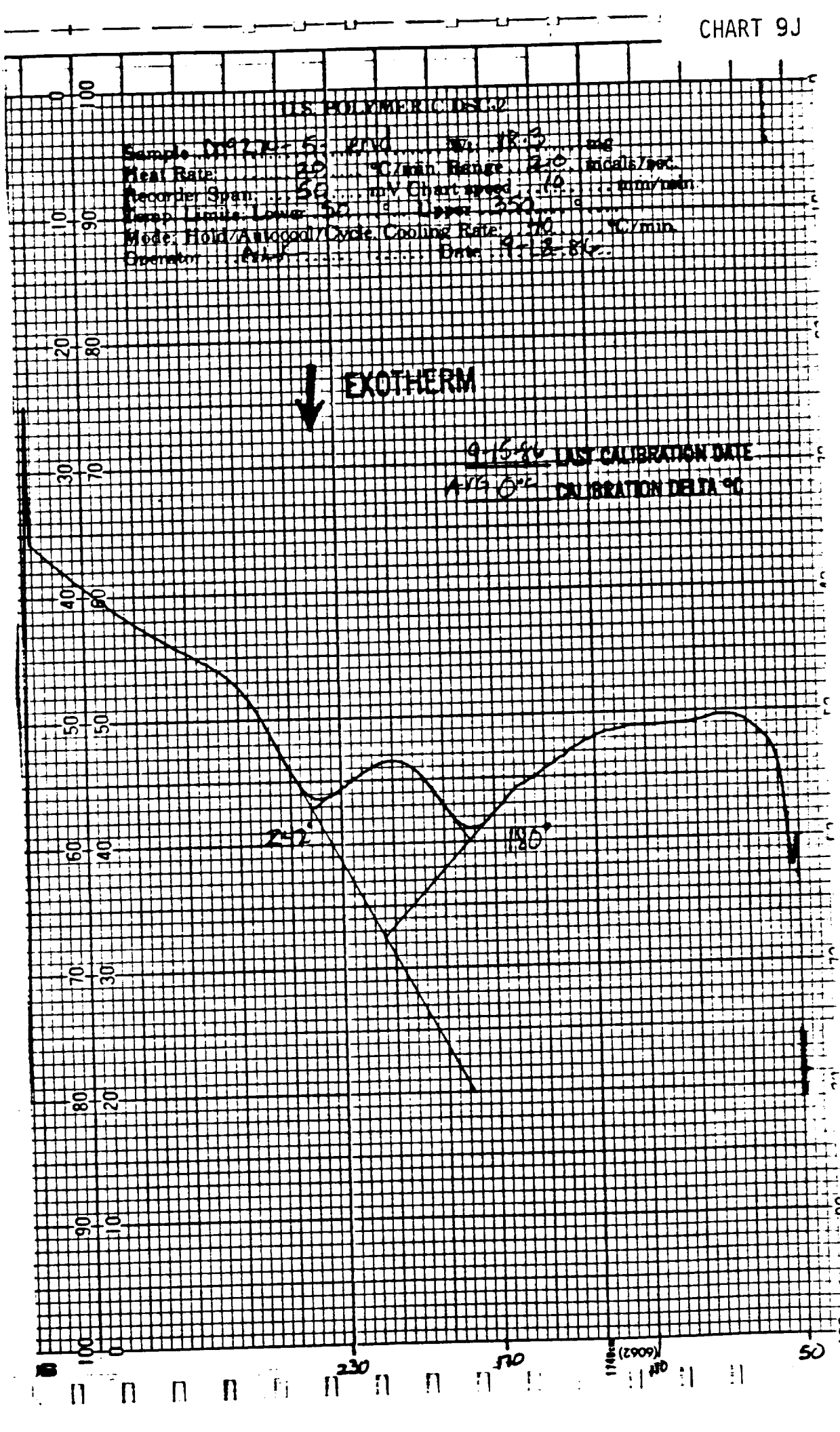

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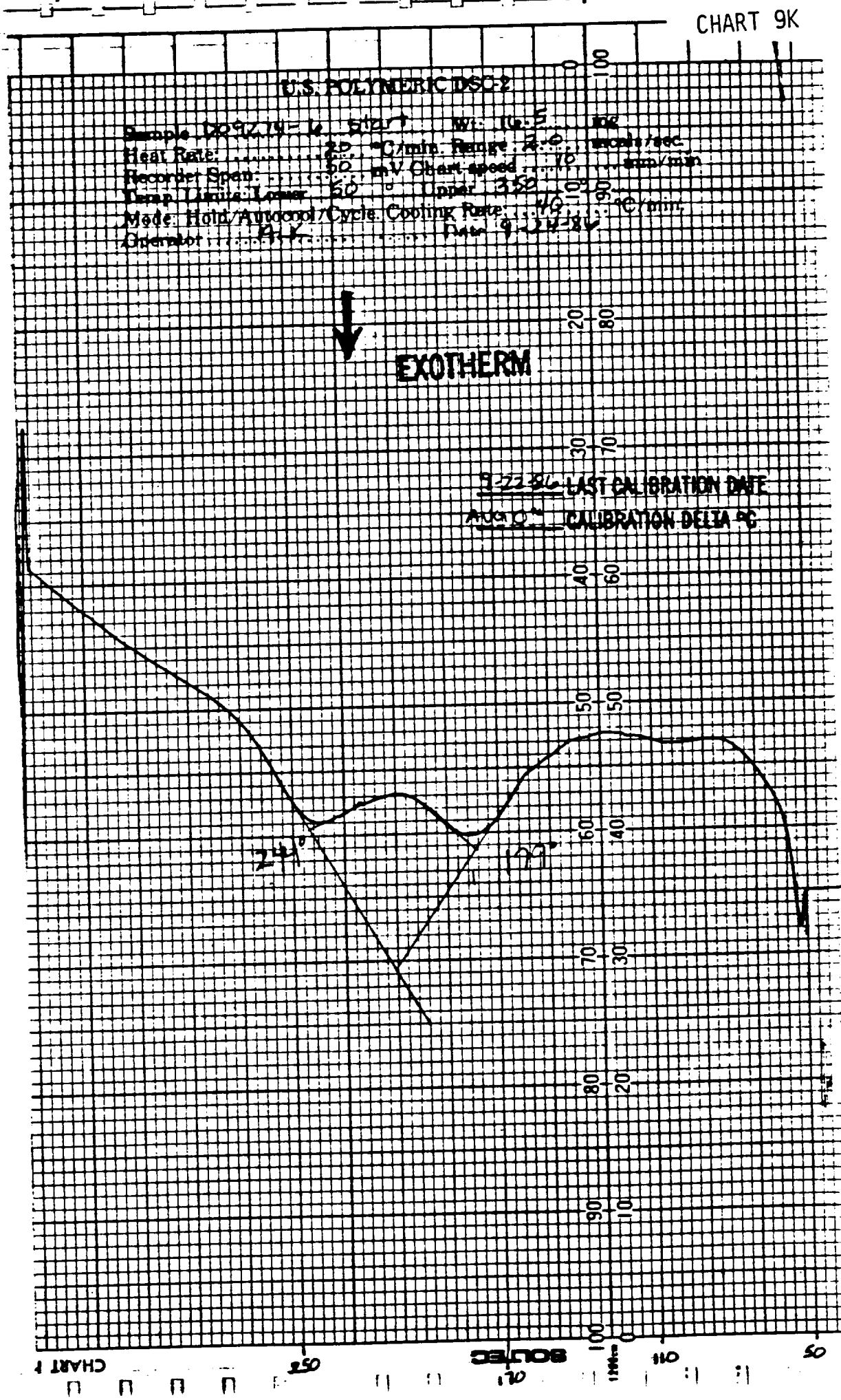

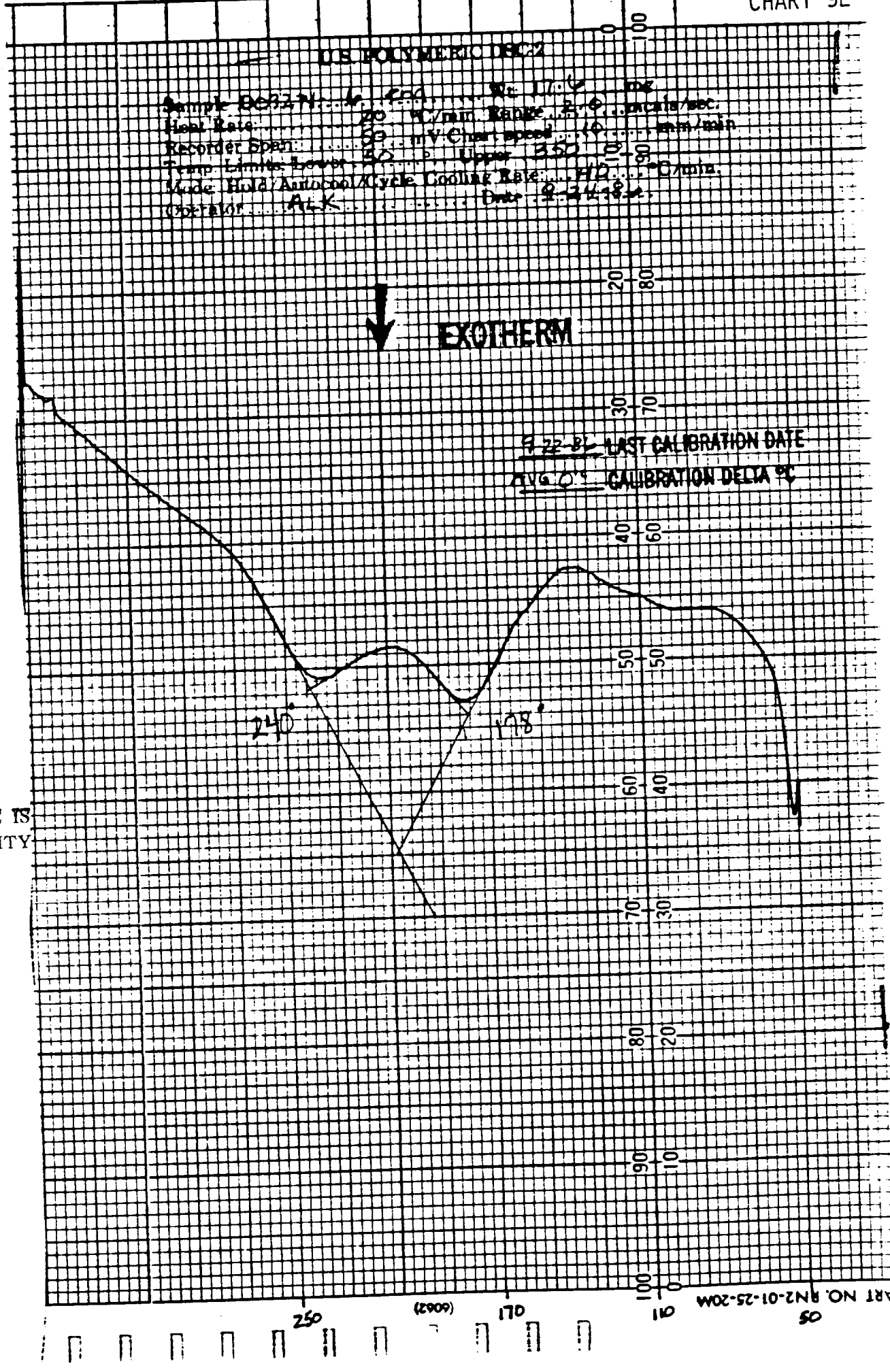

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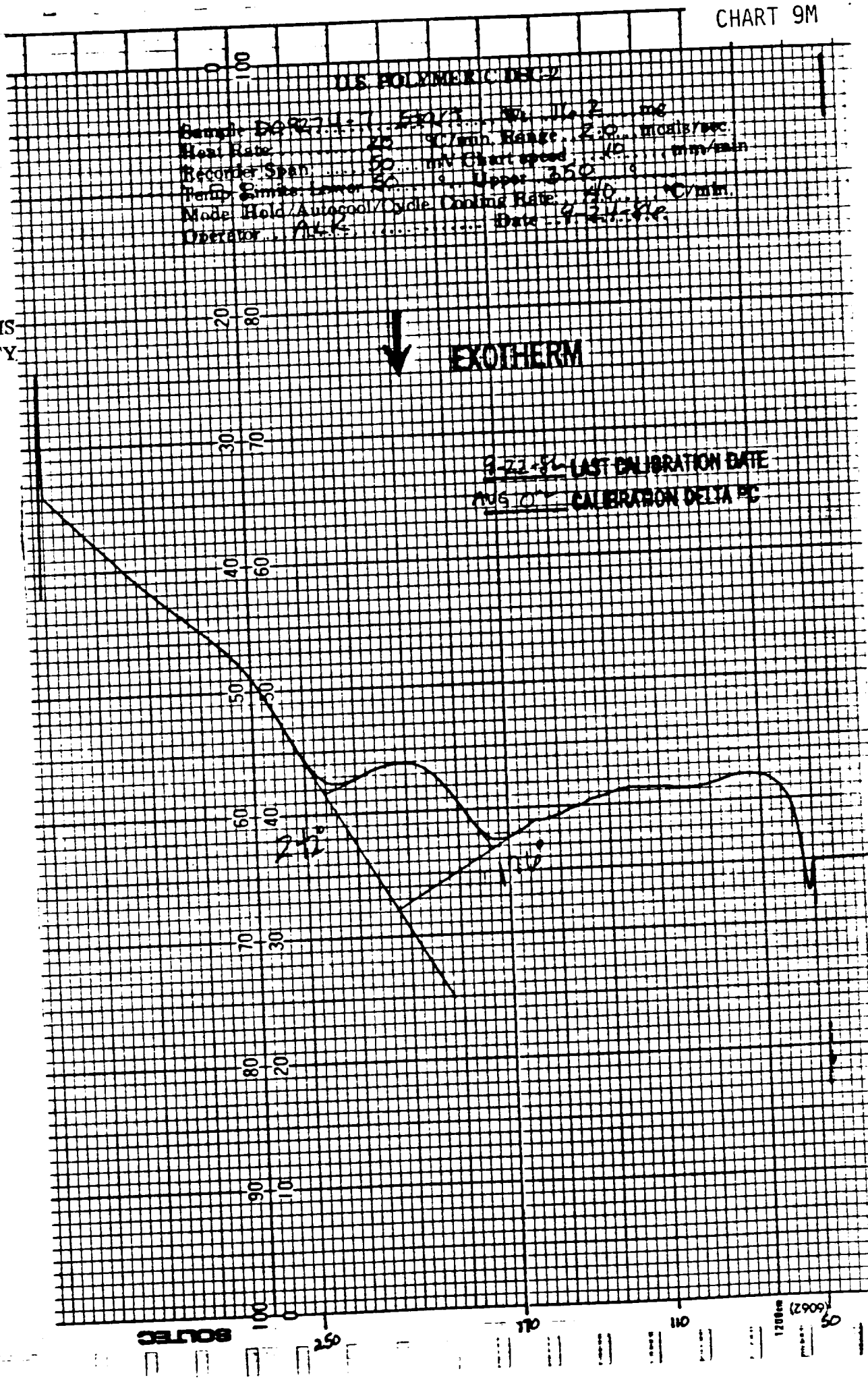

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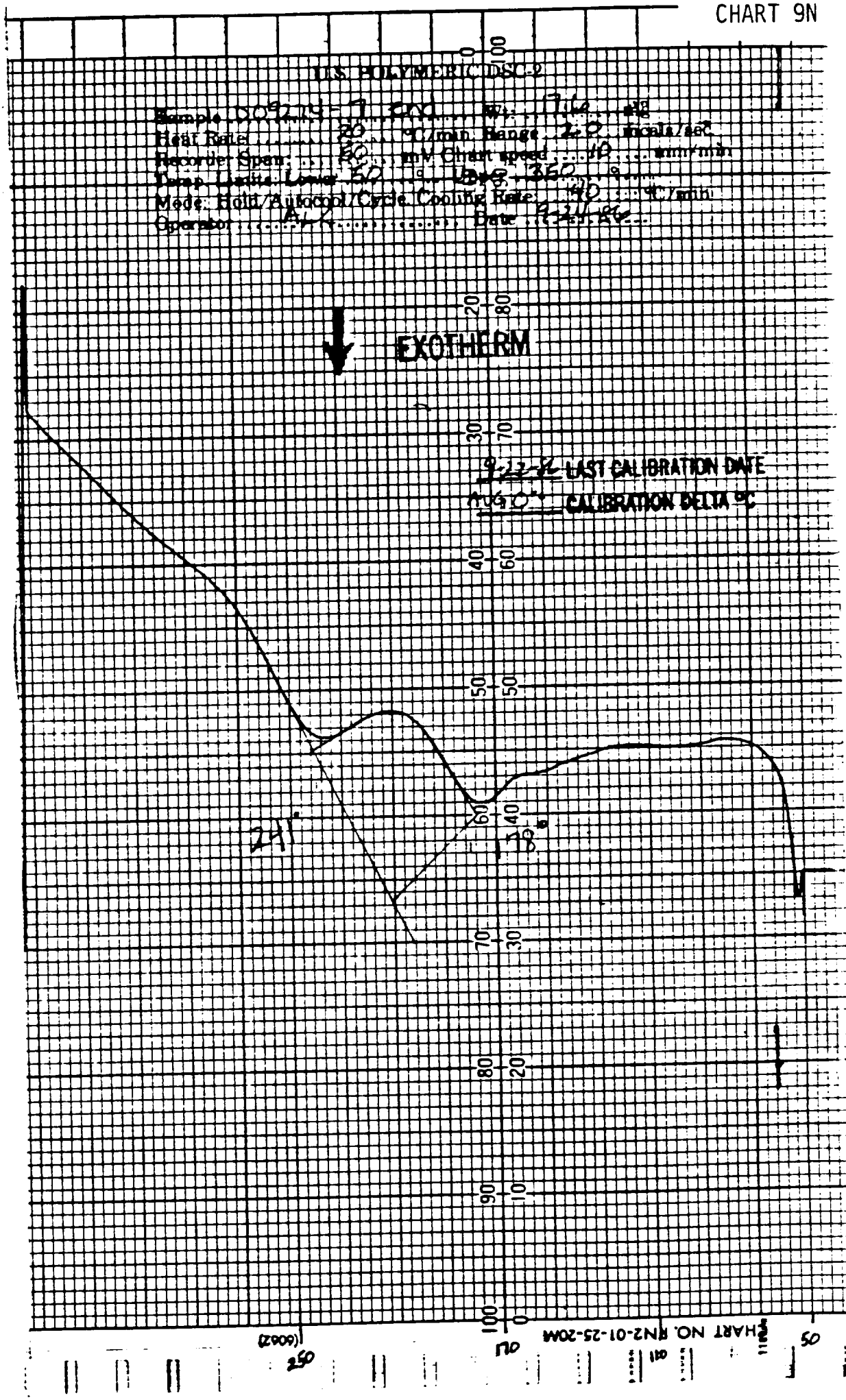

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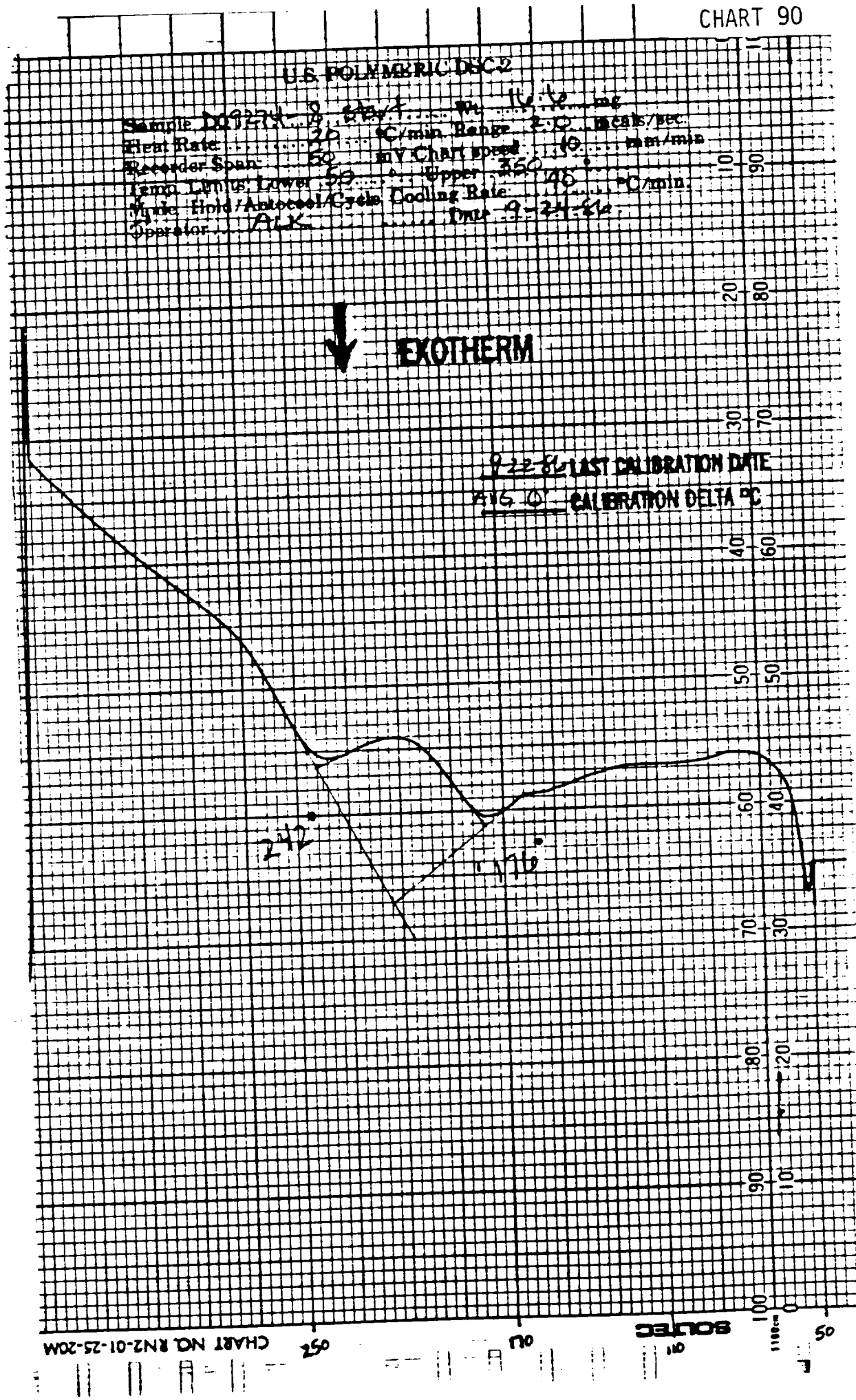

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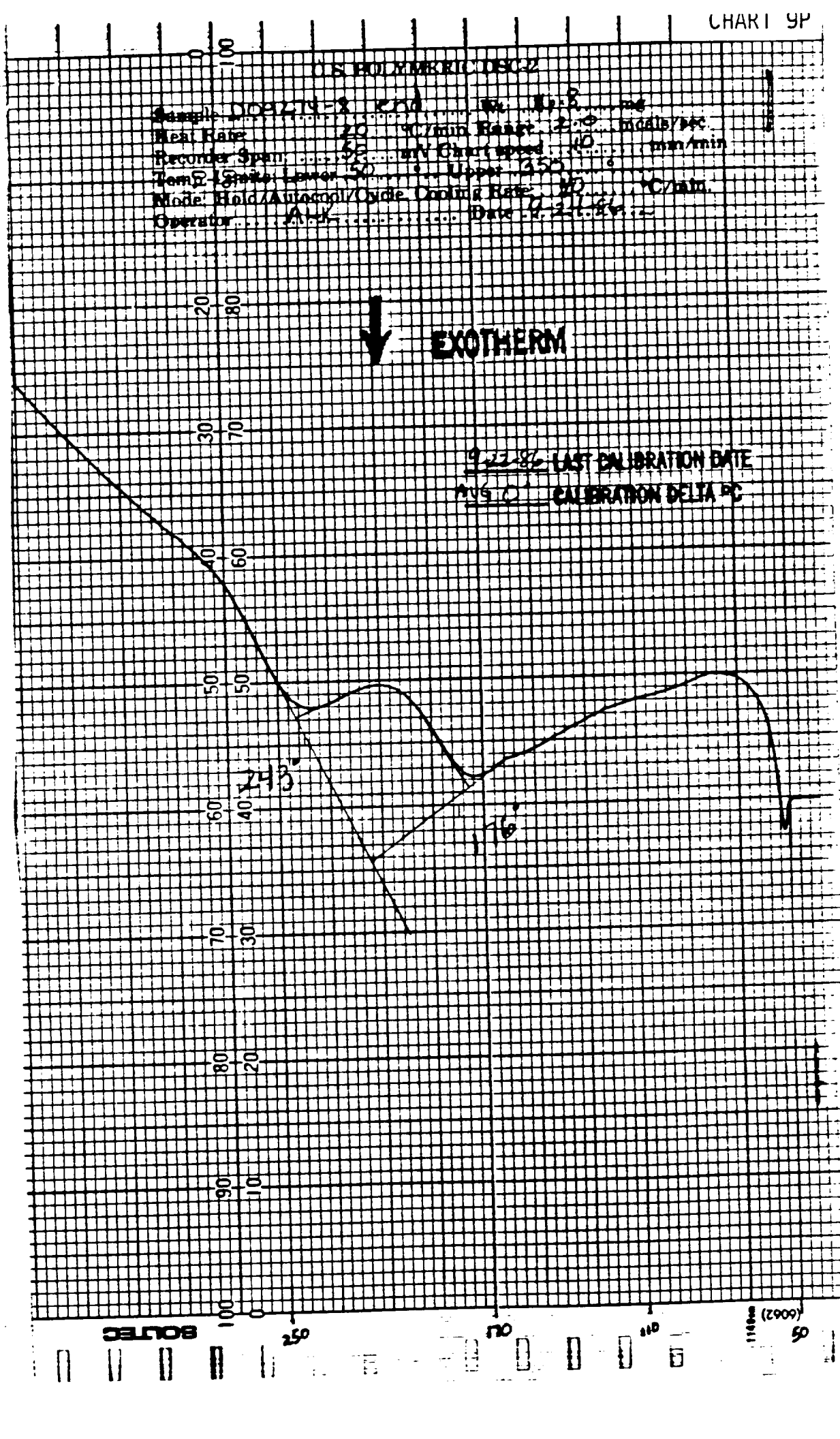

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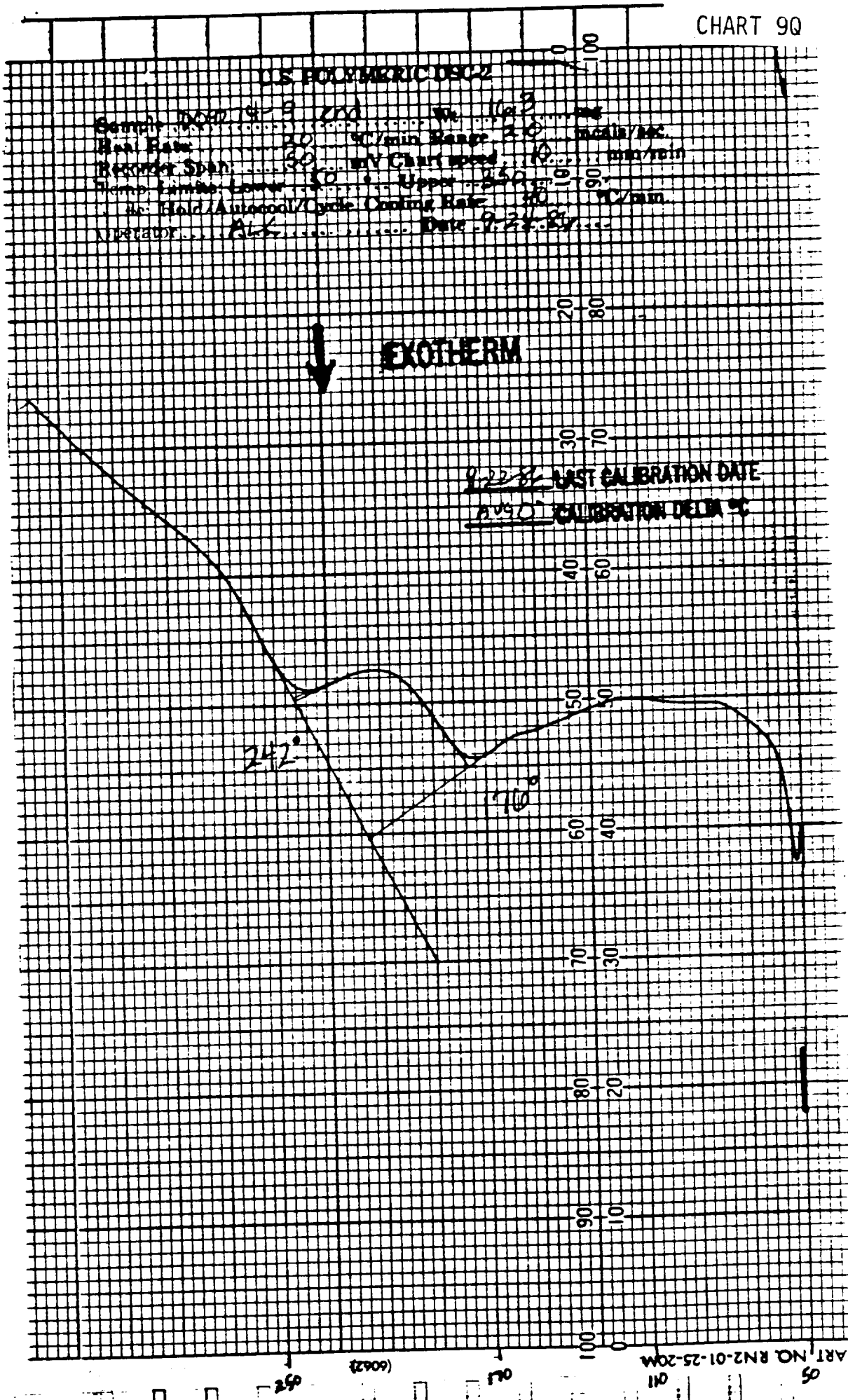
CHART 9Q



SPECTRUM NO. 15121
DATE 6-23-86
SAMPLE FM 5055 B
D09274-S-1

SOURCE
STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®
INFRARED
SPECTROPHOTOMETER

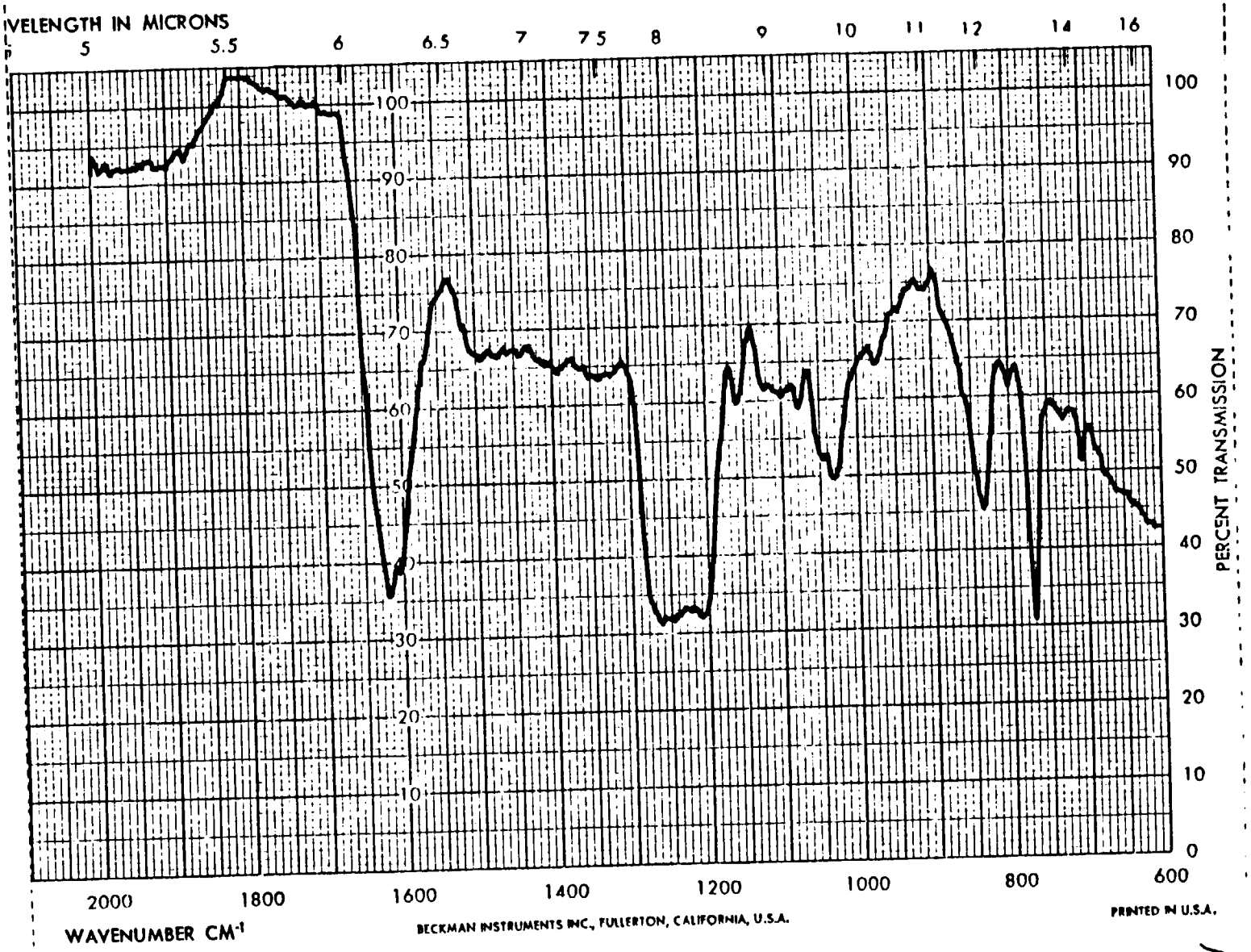


CHART 10A

SPECTRUM NO. 15122
DATE 6-23-87
SAMPLE FM 5055 B
D09274-E-1

SOURCE
STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

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SPECTROPHOTOMETER

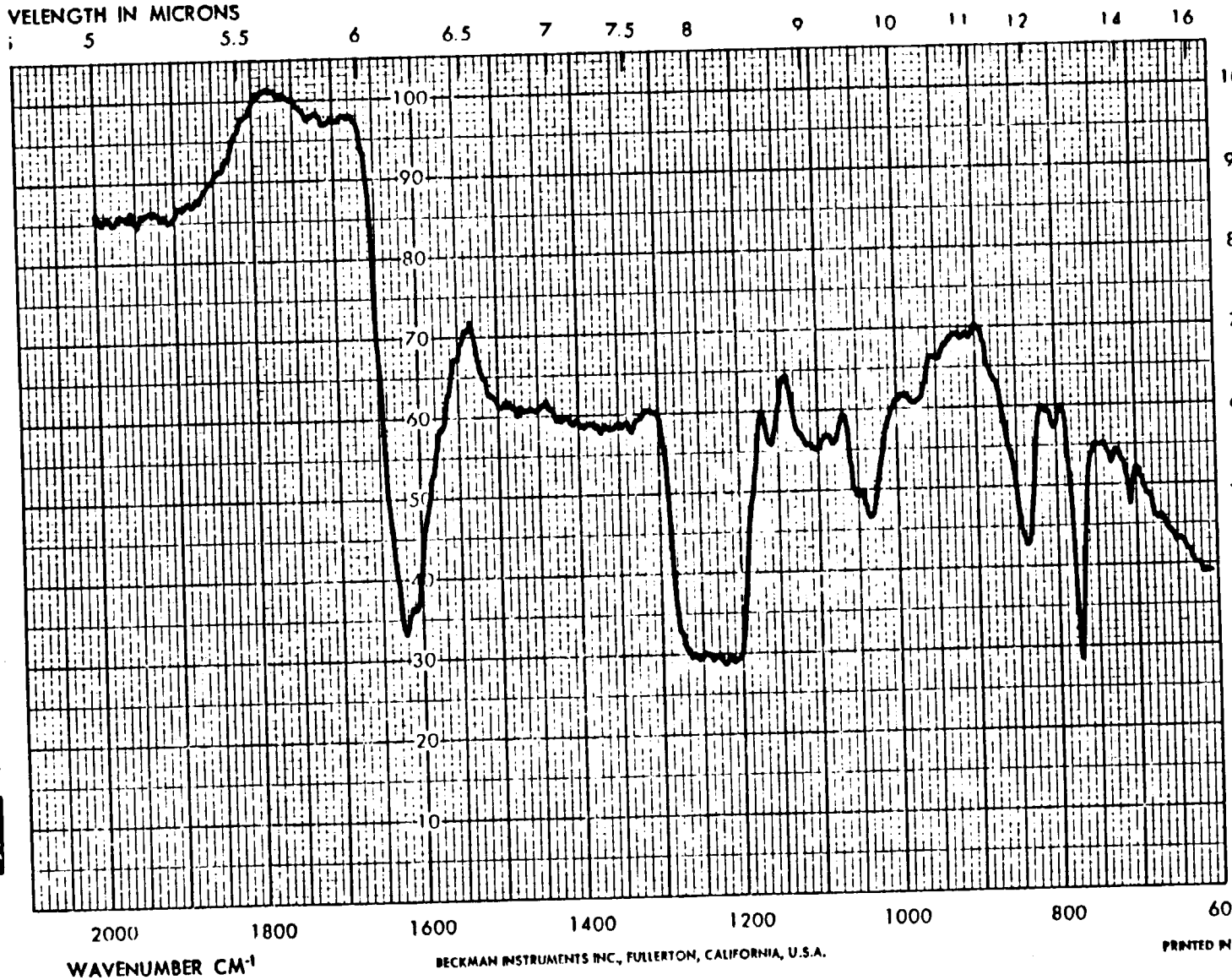

CHART 10B

SPECTRUM NO. 15123
DATE FM5 6-23-86
SAMPLE FM 5055 B
D09271
5-2
SOURCE
STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

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SPECTROPHOTOMETER

CHART 10C

SPECTRUM NO. 15133
DATE 6-24-86
SAMPLE FM 5055 B
D09274-E-2

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE S
COMMENTS PRE-PREG
MATERIAL

ANALYST Y. MIRANDA

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SPECTROPHOTOMETER

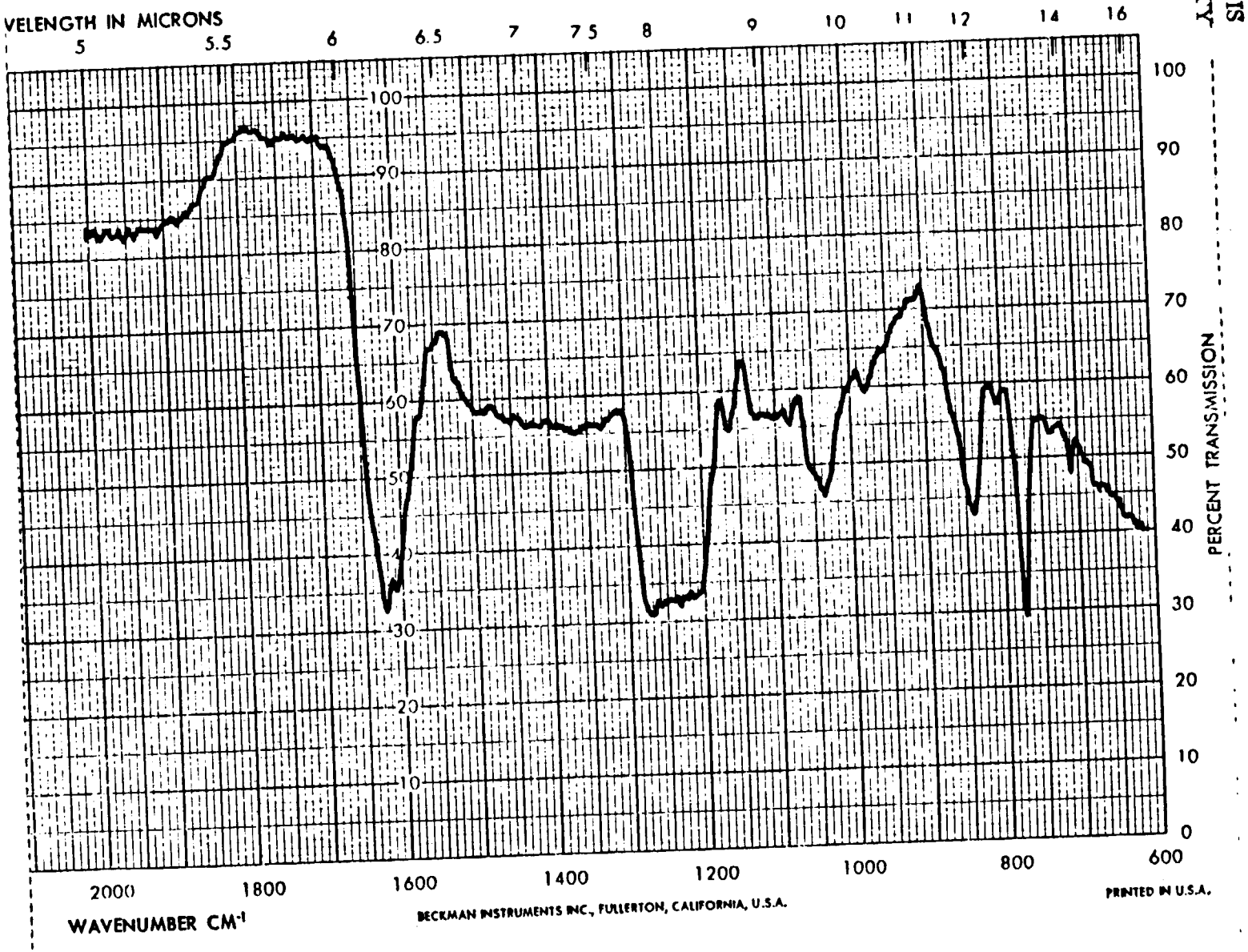

CHART 10D

SPECTRUM NO. 15134
DATE 6-24-86
SAMPLE FM 5055 B
D09274-S-3

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST Y. MIRANDA

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SPECTROPHOTOMETER

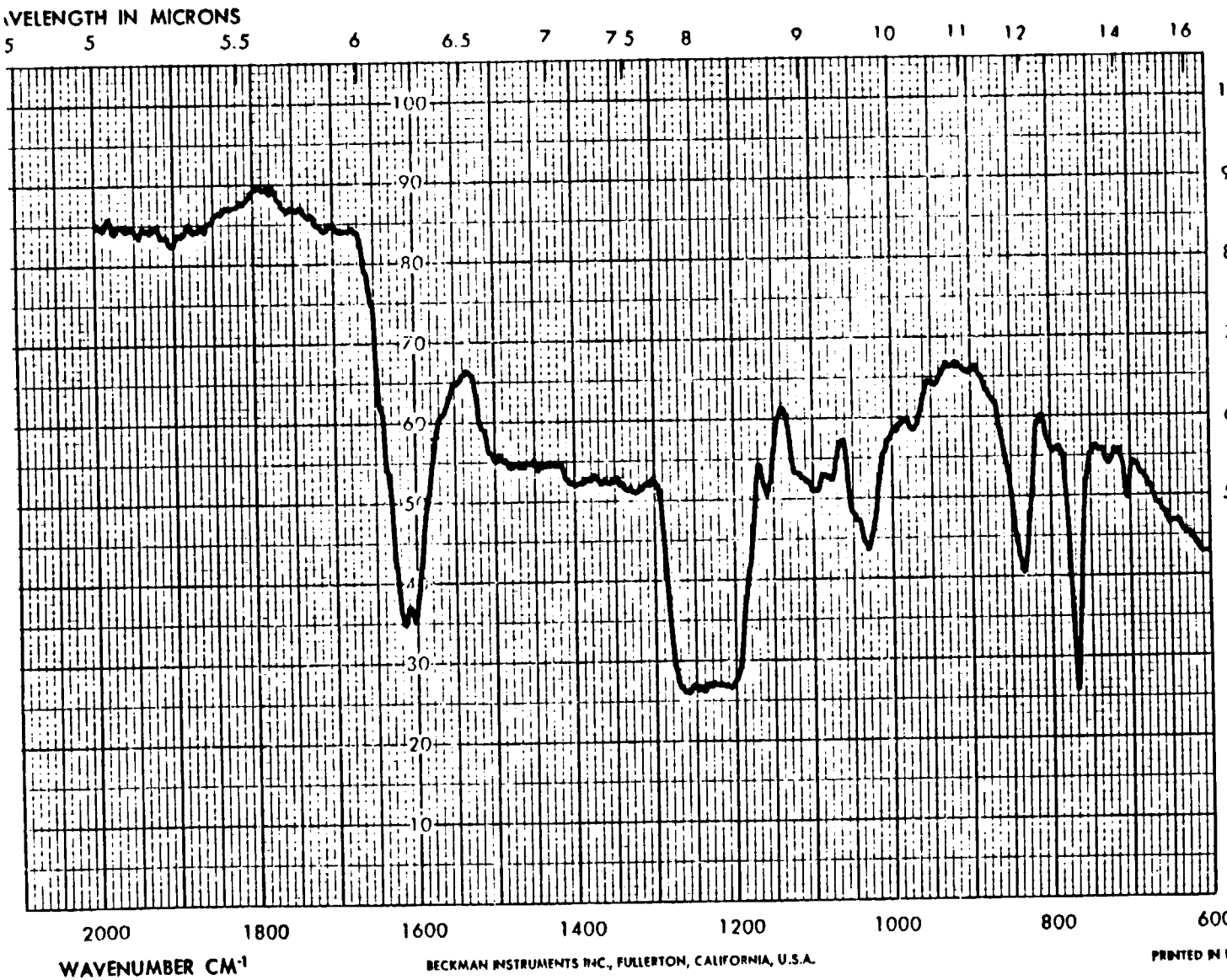

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CHART 10E

SPECTRUM NO. 15135
DATE 6-24-86
SAMPLE F-M 5055B
D09274-E-3

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V.MIRANDA

Beckman®
INFRARED
SPECTROPHOTOMETER

CHART 10F

SPECTRUM NO. 15136
DATE 6-24-86
SAMPLE FM 5055 B
D09271-5-4

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

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CHART 10G

SPECTRUM NO. 15137
DATE 6-24-86
SAMPLE FM 5055 B
D09274-E-4

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST Y. MIRANDA

Beckman®
INFRARED
SPECTROPHOTOMETER

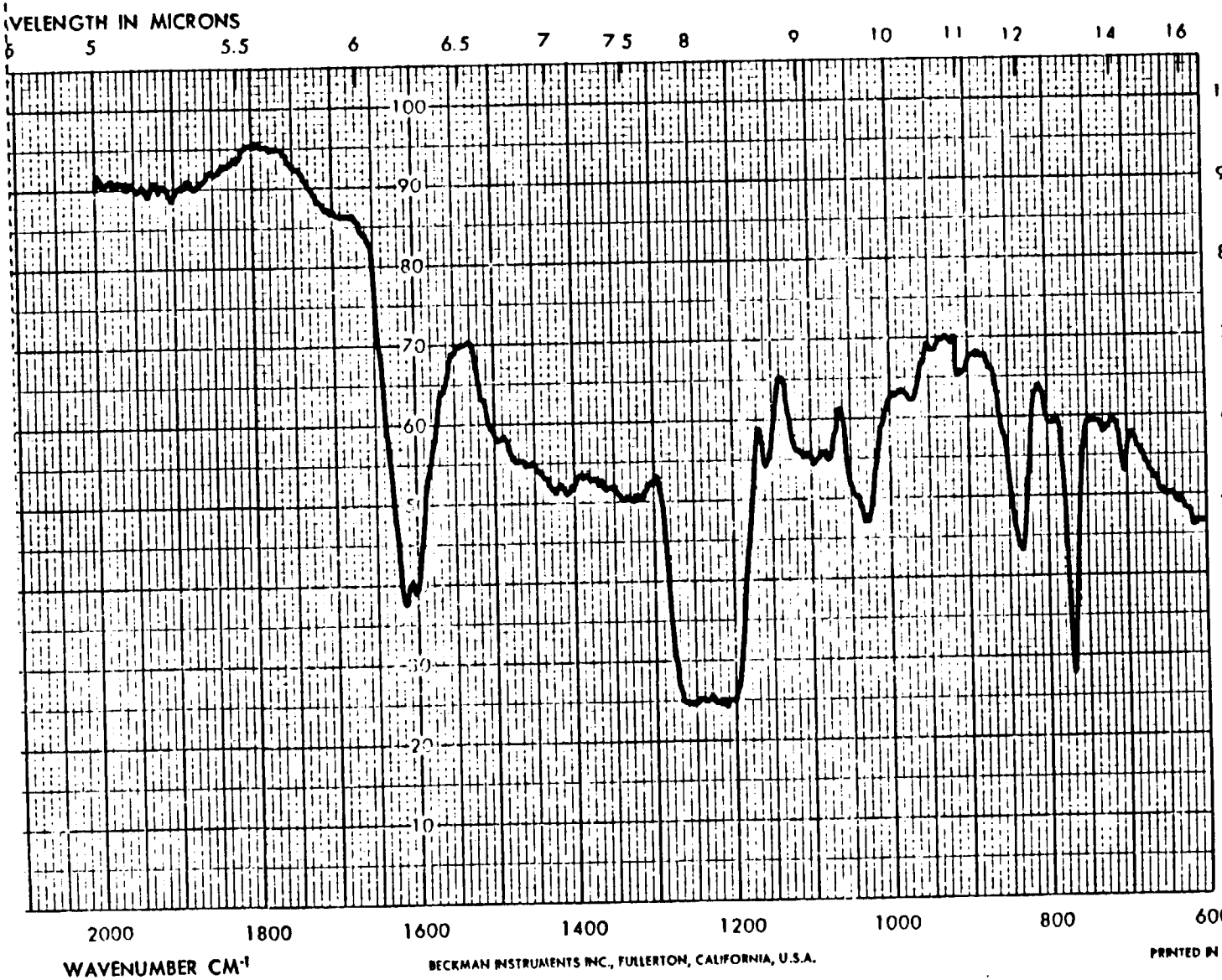

CHART 10H

SPECTRUM NO. 15138
DATE 6-24-86
SAMPLE FM 5055 B
D09274-5-5

SOURCE
STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST Y. MIRANDA

Beckman®
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SPECTROPHOTOMETER

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CHART 101

SPECTRUM NO. 15139
DATE 6-24-86
SAMPLE FM 5055 B
D09274-E-5

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®
INFRARED
SPECTROPHOTOMETER

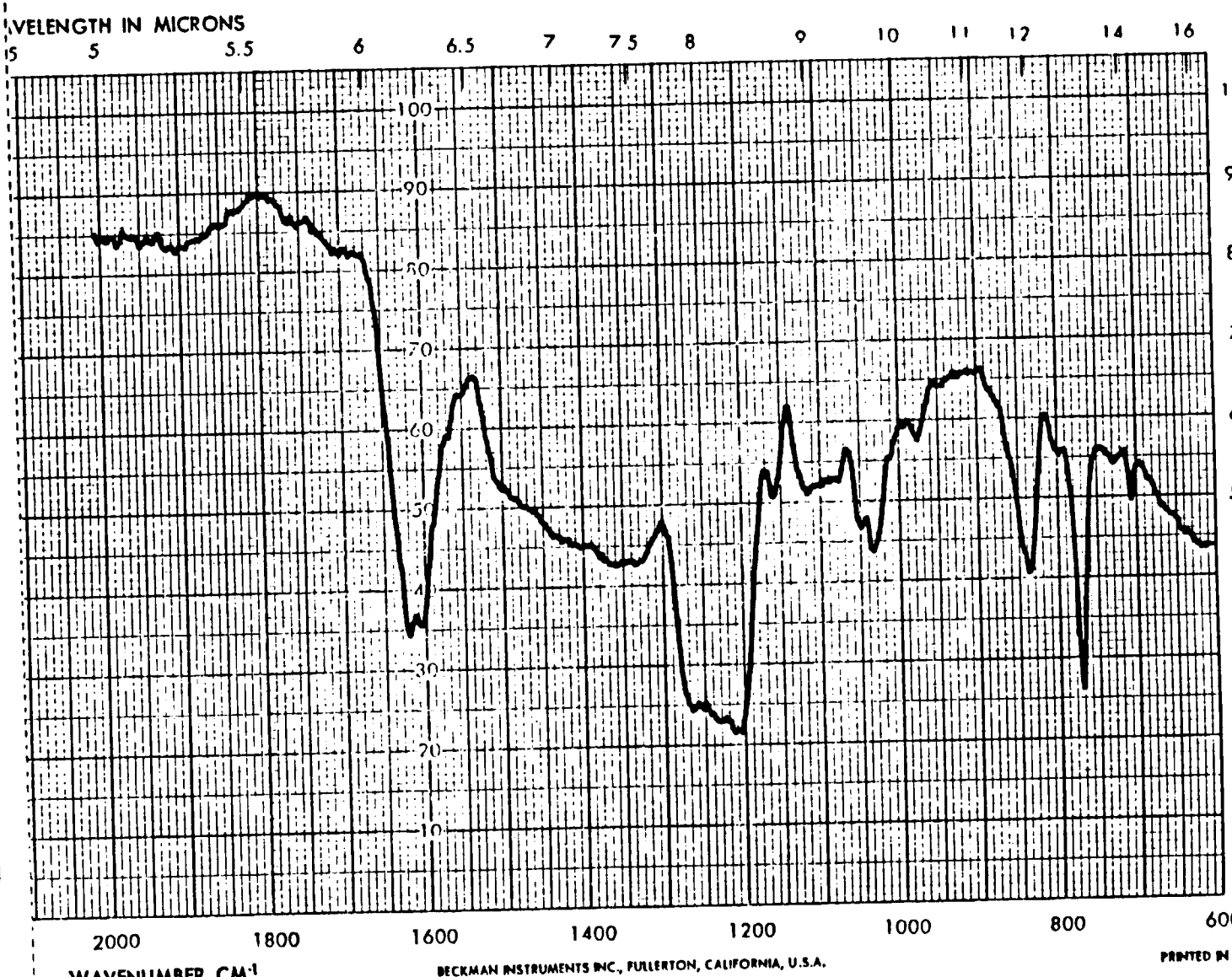

CHART 10J

SPECTRUM NO. 15140
DATE 6-24-86
SAMPLE FM 5055 B
DOE274#5-6

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST Y. MIRANDA

Beckman®
INFRARED
SPECTROPHOTOMETER

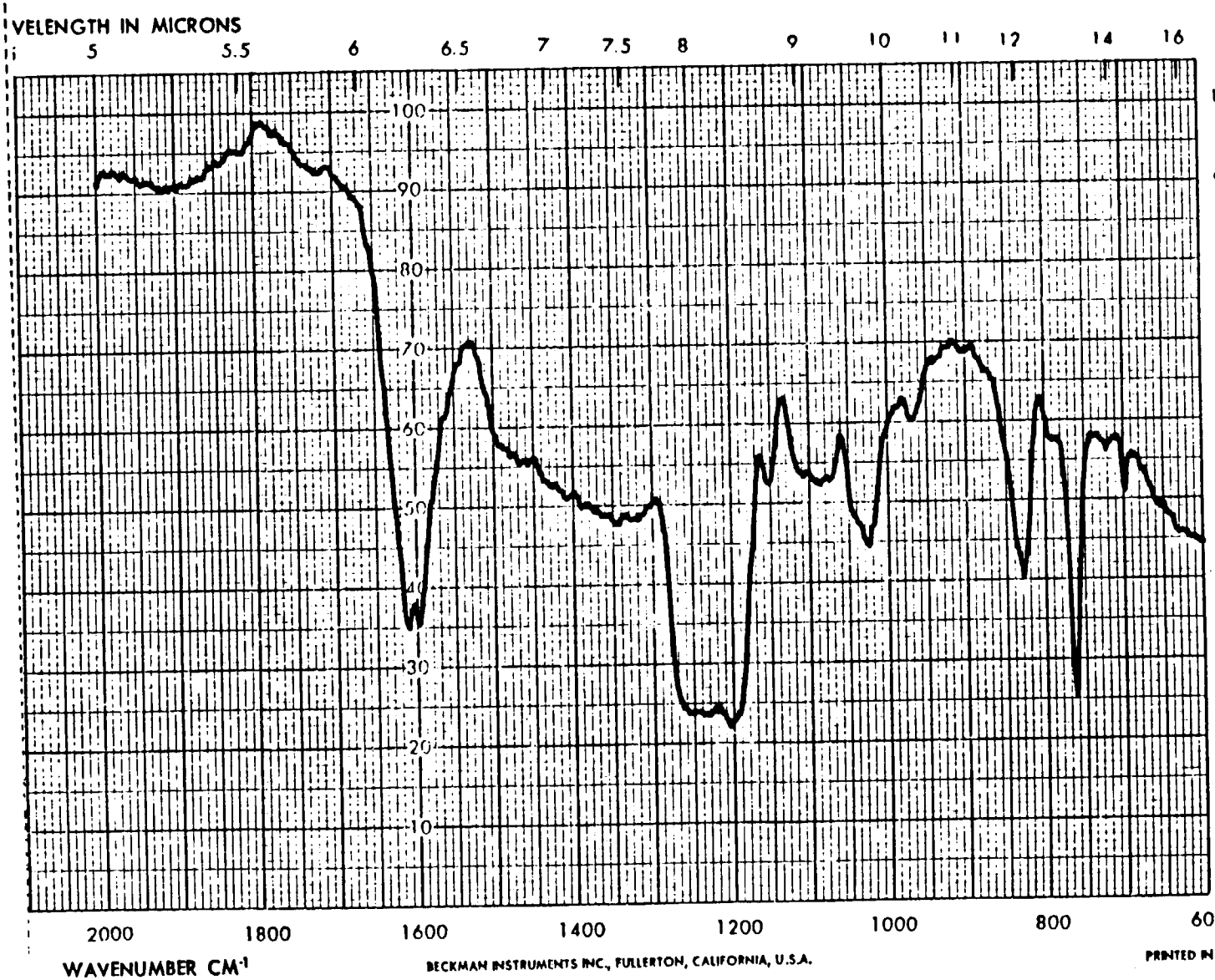

CHART 10K

SPECTRUM NO. 15161

DATE 7-03-86

SAMPLE FM 5055 B
D09274 # E-6

SOURCE

STRUCTURE

PATH 0.2 mm NACL

SOLVENT ACETONE

CONCENTRATION 30-50%

PHASE 3

COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®

INFRARED
SPECTROPHOTOMETER

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CHART 10L

SPECTRUM NO. 15162
DATE 7-03-86
SAMPLE FM 5055 B
D09274 #S-7

SOURCE
STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50 %
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST Y. MIRANDA

Beckman®
INFRARED
SPECTROPHOTOMETER

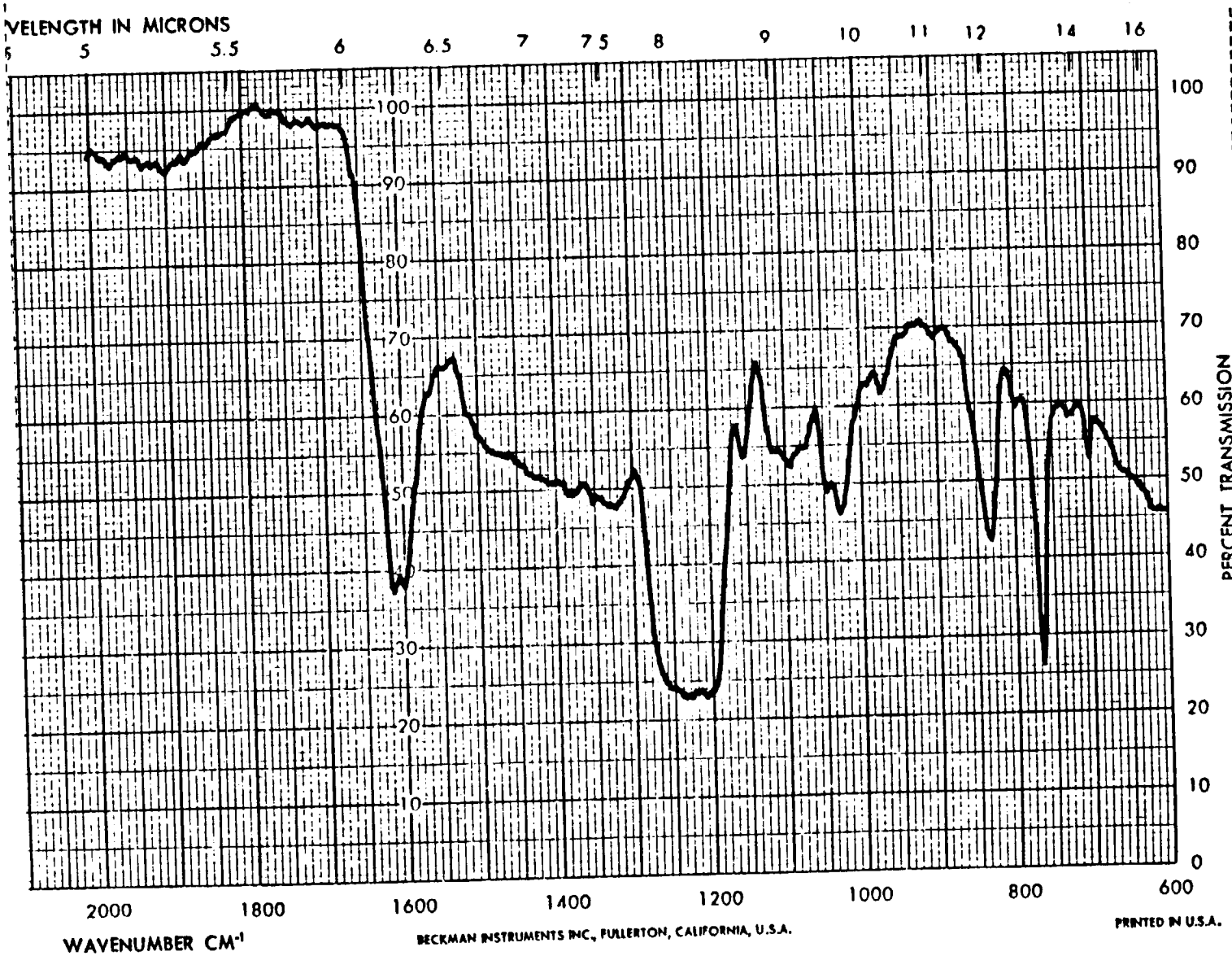

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CHART 10M

SPECTRUM NO. 15163

DATE 7-03-84

SAMPLE FM 5055B
D09274 #-E-7

SOURCE

STRUCTURE

PATH 0.2 mm NACL

SOLVENT ACETONE

CONCENTRATION 30-50%

PHASE S

COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®

INFRARED
SPECTROPHOTOMETER

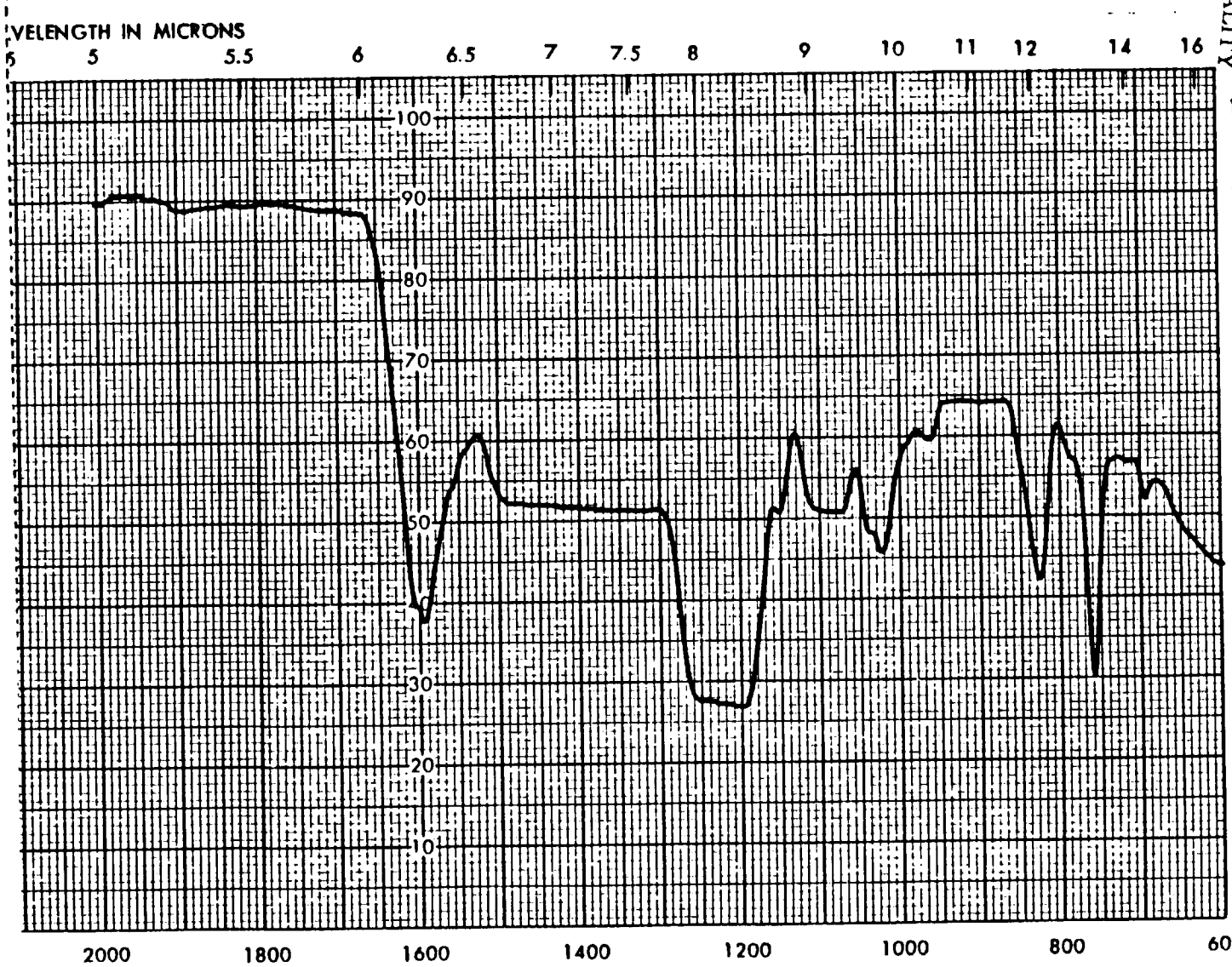

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CHART 10N

SPECTRUM NO. 15164
DATE 7-03-86
SAMPLE FM 5055 B
DO 9274 # 5-B

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®
INFRARED
SPECTROPHOTOMETER

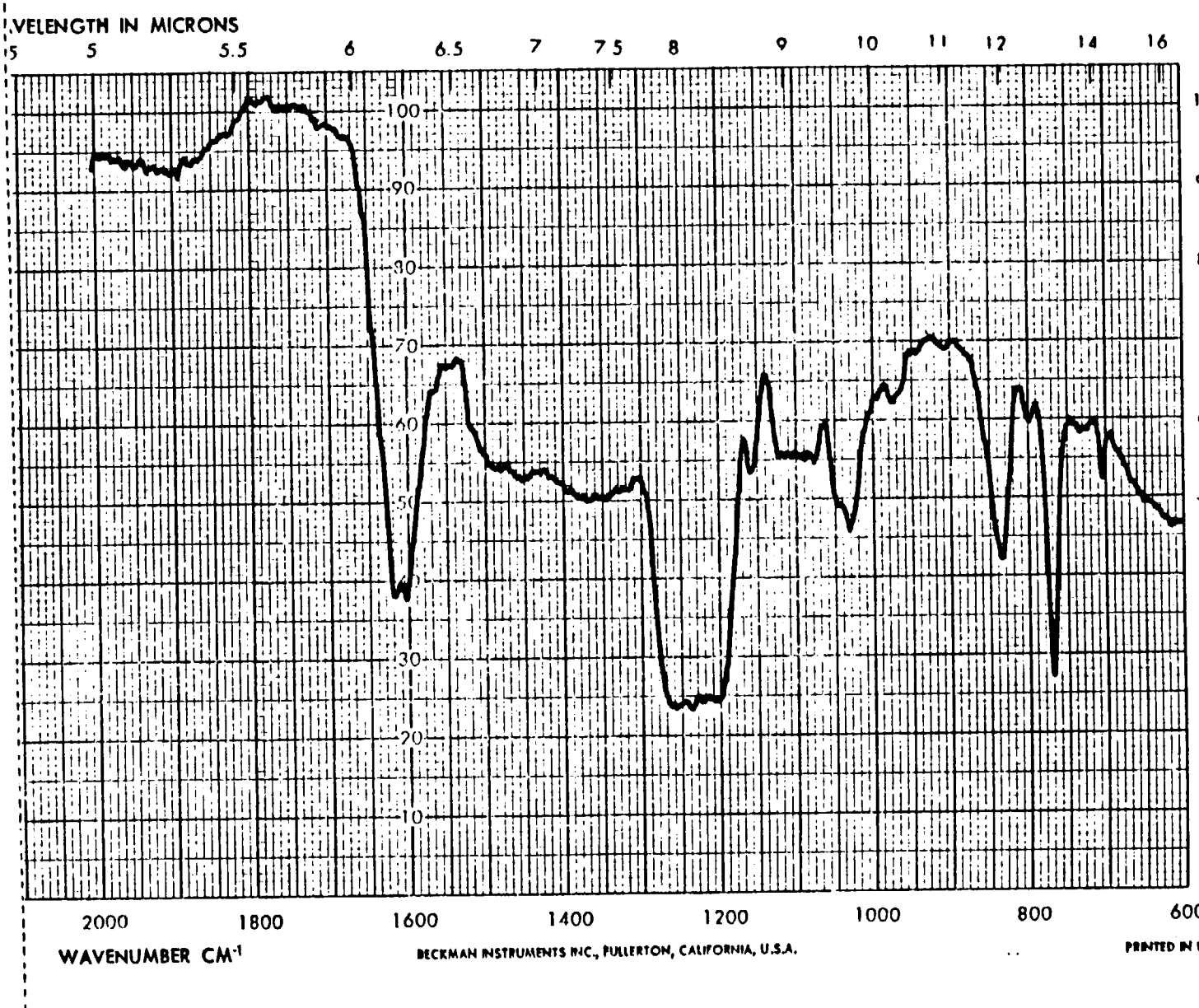

CHART 100

SPECTRUM NO. 15165
DATE 7-03-86
SAMPLE FM5055B
D09274 # E-8

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%T
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®
INFRARED
SPECTROPHOTOMETER

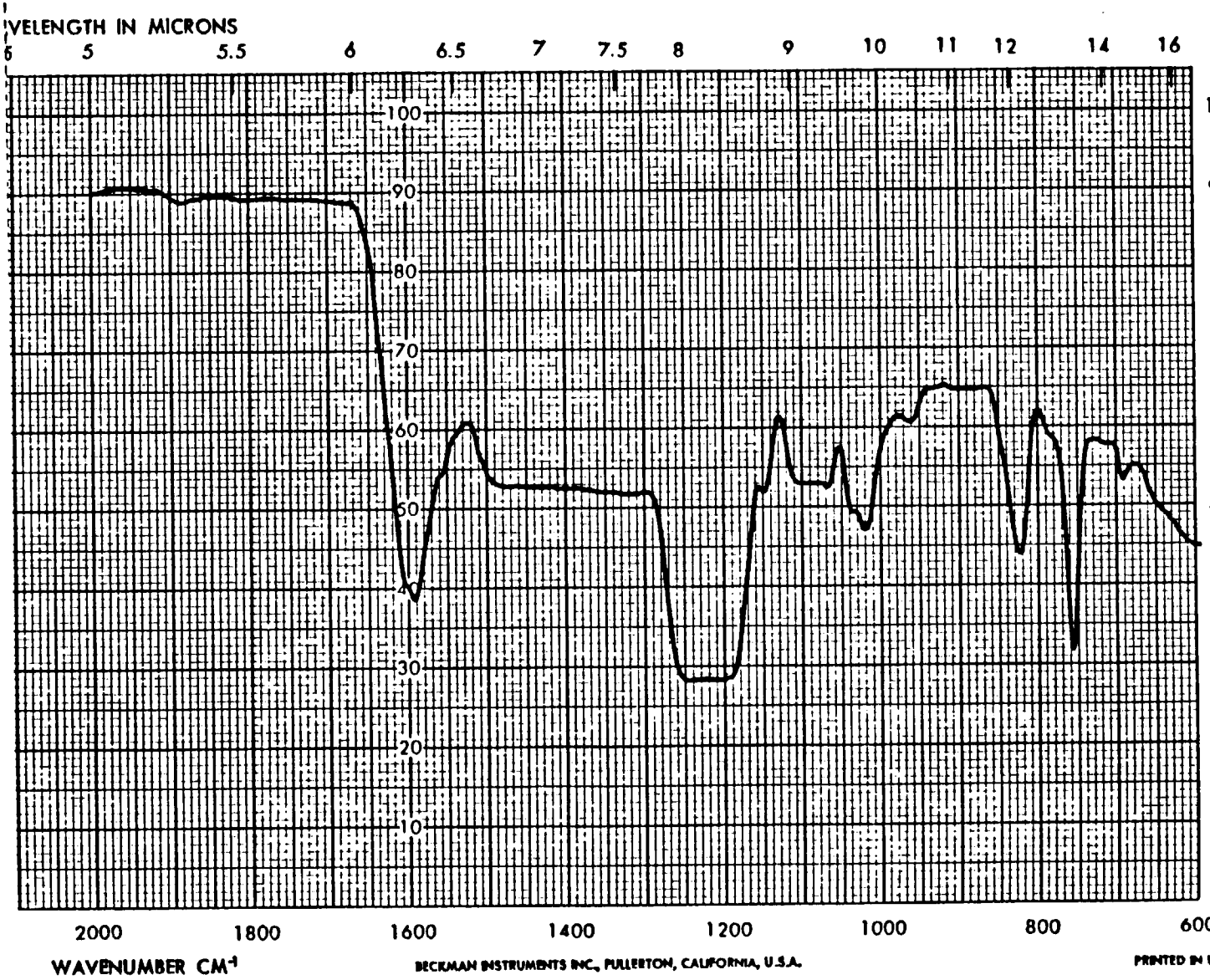

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CHART 10P

SPECTRUM NO. 15166
DATE 7-03-86
SAMPLE FM 5055 B
D9274 # 5-9

SOURCE
STRUCTURE

PATH 0.7 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50% T
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®

INFRARED
SPECTROPHOTOMETER

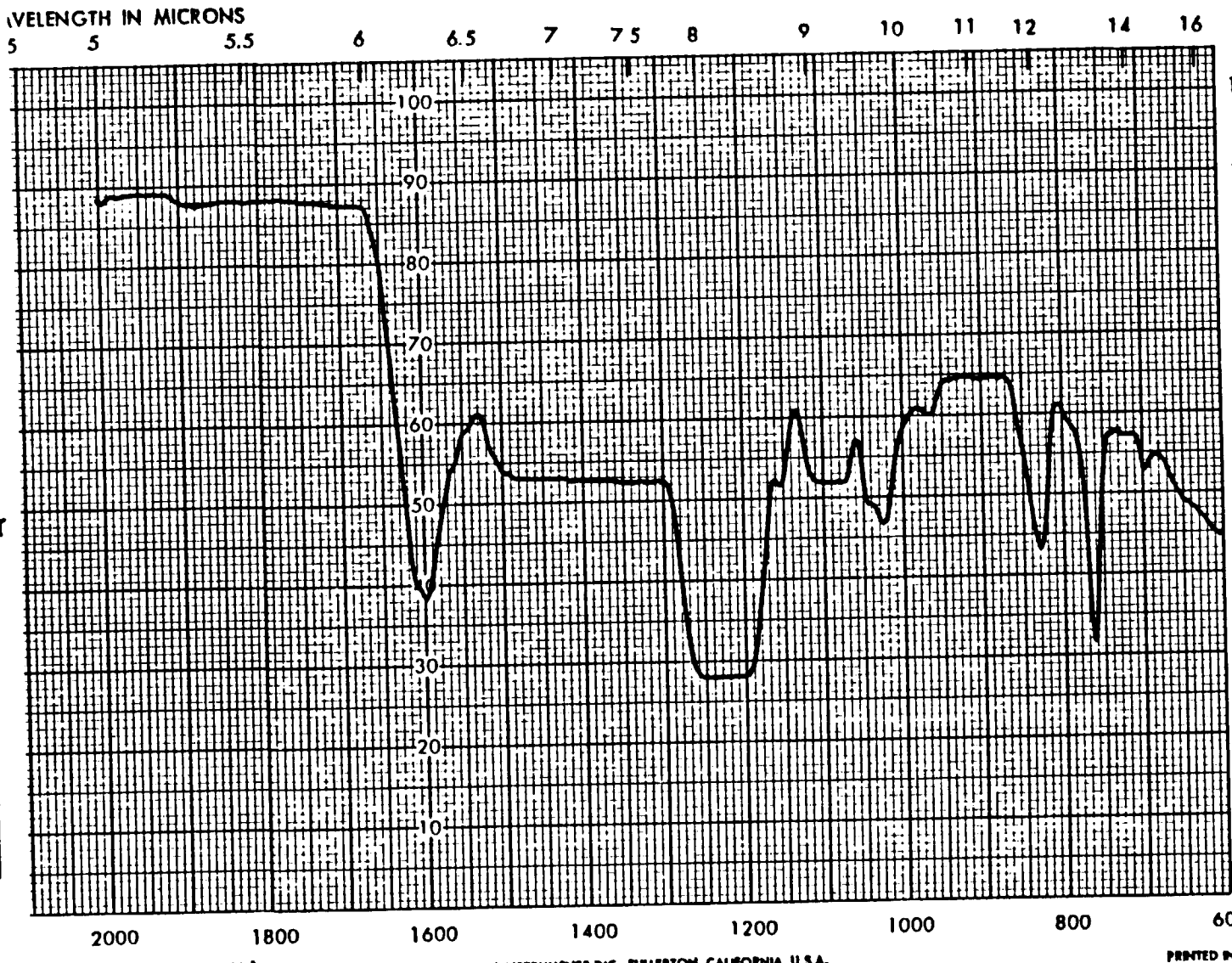

CHART 100

SPECTRUM NO. 15167
DATE 7-03-86
SAMPLE FM5055B
D09274 # E-9

SOURCE
STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®
INFRARED
SPECTROPHOTOMETER

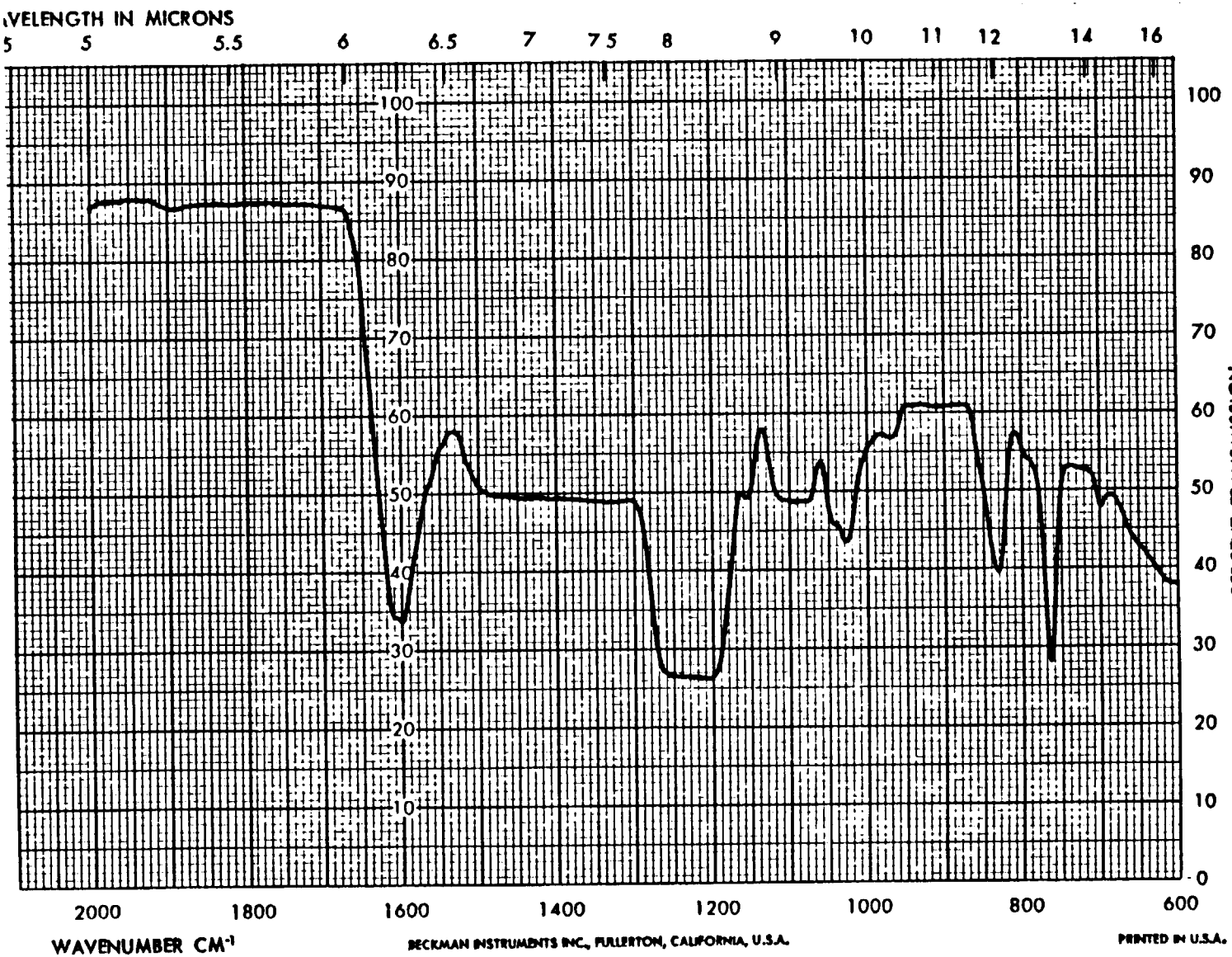

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CHART 10R

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Chart 21A1

Chart 21A2

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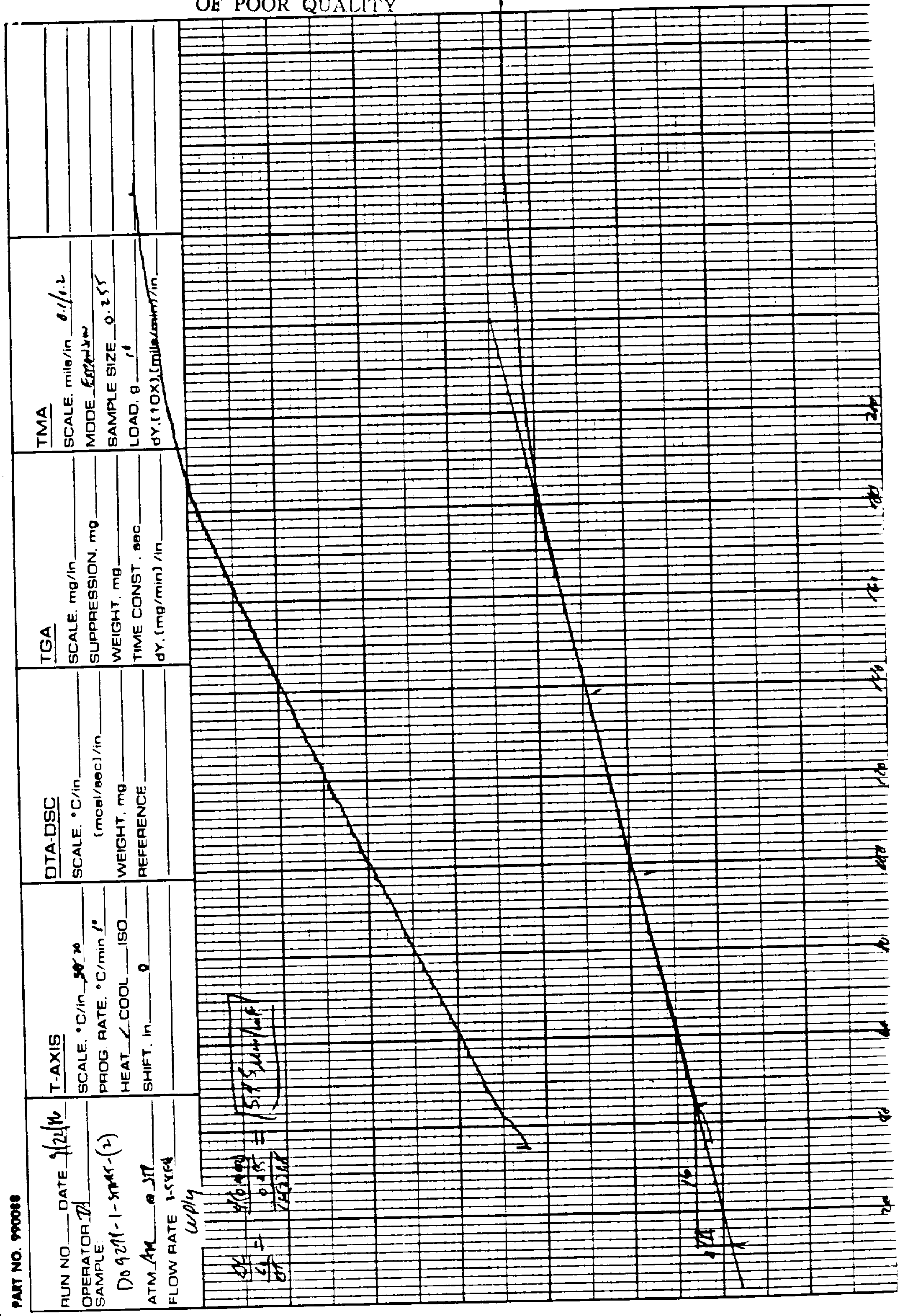

DUPONT Instruments

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DUPONT Instruments

MEASURED VARIABLE

PART NO. 990088

RUN NO ___ DATE 9/24/96 OPERATOR DH SAMPLE: D09274-1-Smear-(4) ATM Air @ STP FLOW RATE 2-5SCCM XPLY	T-AXIS SCALE, °C/in 50 20 PROG RATE, °C/min 10 HEAT ✓ COOL ___ ISO ___ SHIFT, in 0	DTA-DSC SCALE, °C/in ___ (mcal/sec)/in ___ WEIGHT, mg ___ REFERENCE ___	TGA SCALE, mg/in ___ SUPPRESSION, mg ___ WEIGHT, mg ___ TIME CONST, sec ___ dY, (mg/min)/in ___	TMA SCALE, mils/in 0.1/0.2 MODE Expansion SAMPLE SIZE 0.123 LOAD, g 10 dY, (10X), (mils/min)/in ___	

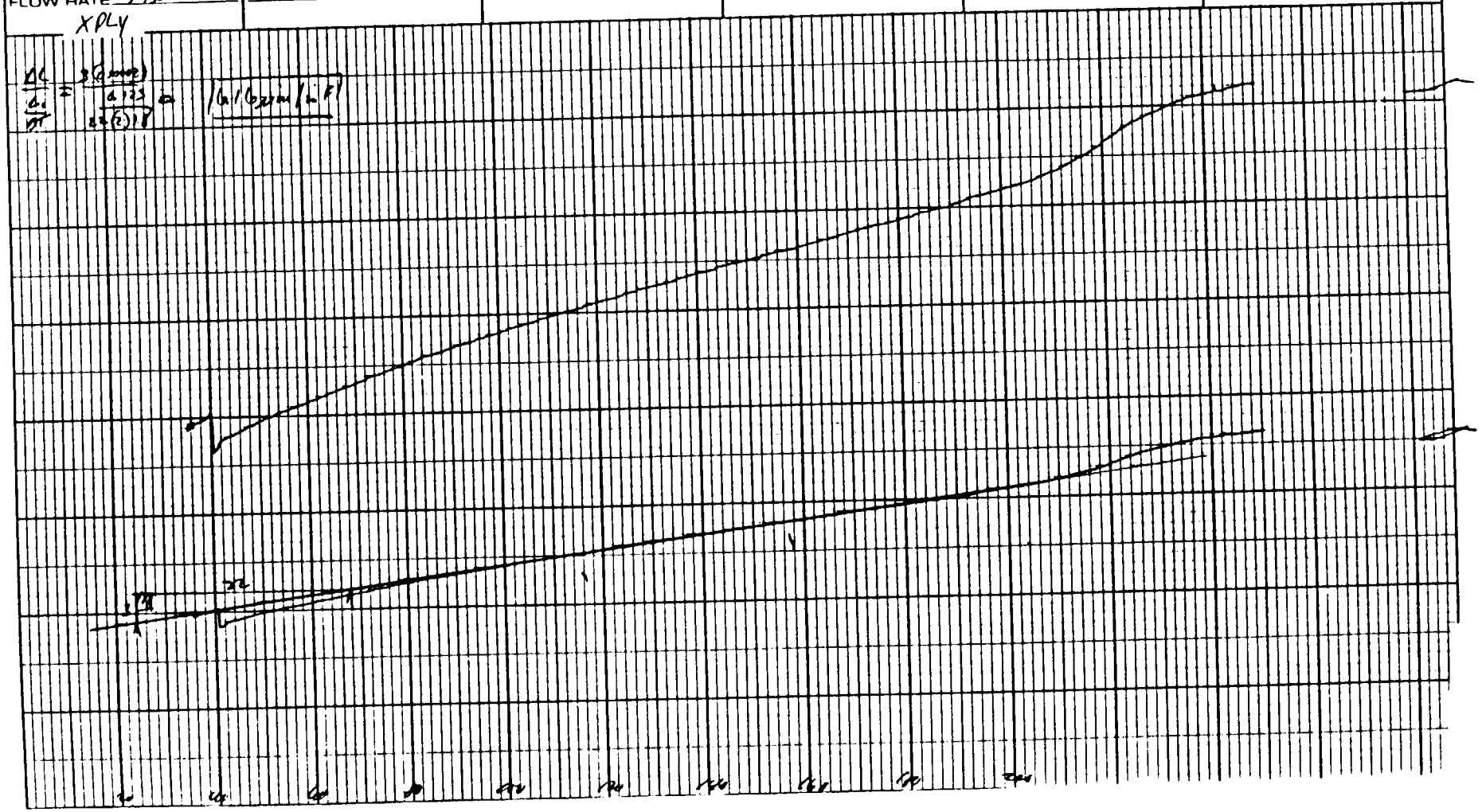

Chart 21B1

PART NO. 990068

RUN NO. ___ DATE 9/13/94
OPERATOR TA
SAMPLE
D09374-1-END-(1)
ATM Air @ 50
FLOW RATE 1.5SCFM
wpl

T-AXIS
SCALE, °C/in 50 2
PROG RATE, °C/min 2
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST, sec ___
dY/dt (mg/min)/in ___

TMA
SCALE, mils/in 0.1/0.2
MODE Expansion
SAMPLE SIZE 0.262
LOAD, g 2
dY/dt (10X) (mils/min)/in ___

MEASURED VARIABLE

DUPONT Instruments

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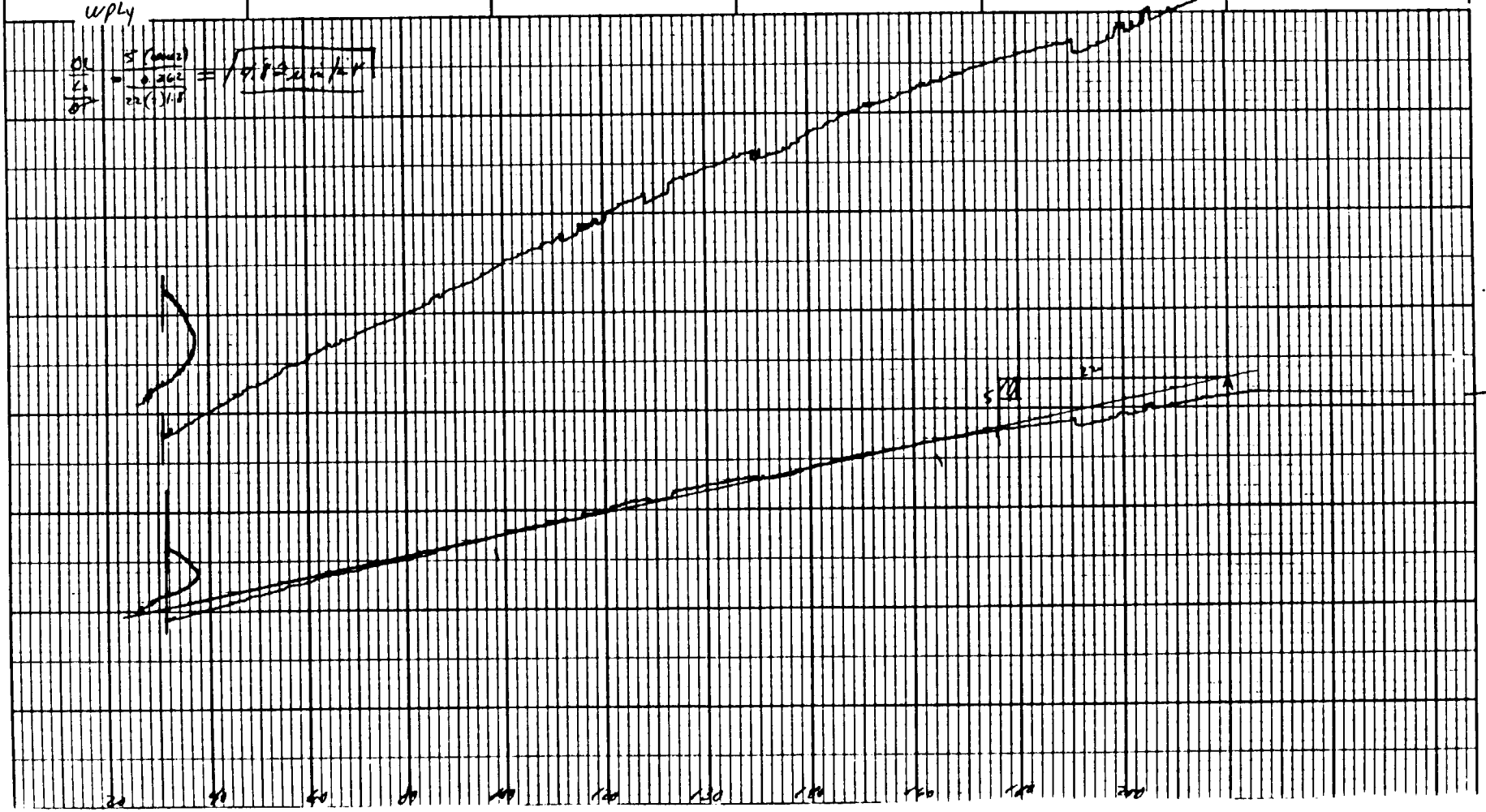
ORIGINAL PAGE IS OF POOR QUALITY

PART NO. 990088

RUN NO ___ DATE 9/23/84	T-AXIS	DTA-DSC	TGA	TMA	
OPERATOR TH	SCALE, °C/in 50 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE: D09274-1-END (2)	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
ATM Ar @ STP	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.262	
FLOW RATE 3-5 SCFH	SHIFT, in 0	REFERENCE	TIME CONST., sec	LOAD, g 10	
wply			dY, (mg/min) /in	dY, (10X), (mils/min)/in	



MEASURED VARIABLE

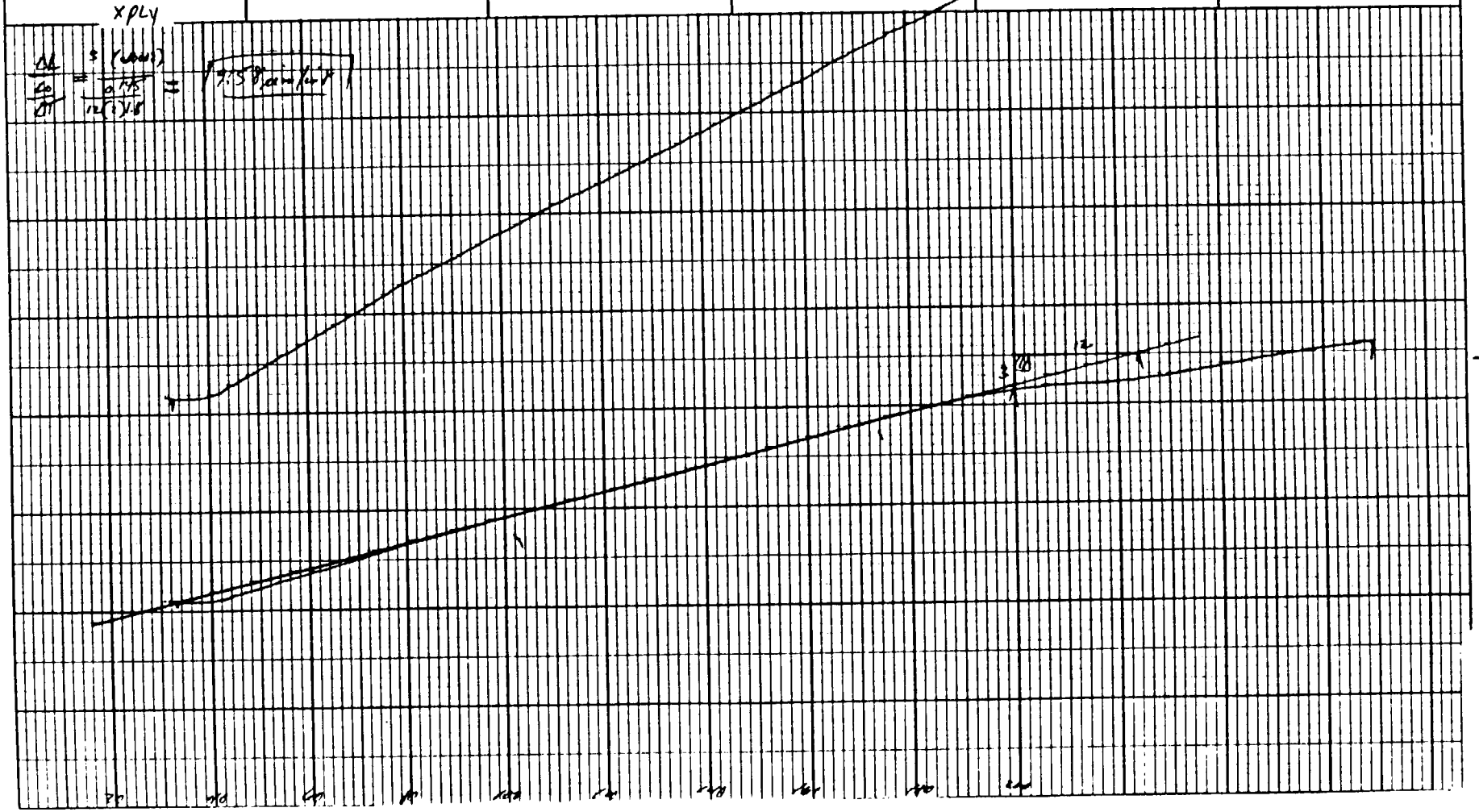
DUPONT Instruments

Chart 21B2

PART NO. 990088

RUN NO ___ DATE 9/24/94	T-AXIS	DTA-DSC	TGA	TMA	
OPERATOR [illegible]	SCALE, °C/in 50 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE	PROG RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
D0927d-1-END-(3)	HEAT ___ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.145	
ATM Air @ STP	SHIFT, in 0	REFERENCE	TIME CONST., sec	LOAD, g 10	
FLOW RATE 2-SSCM			dY, (mg/min) /in	dY, (10X) (mils/min) /in	

XPLY



DUPONT Instruments

MEASURED VARIABLE

Chart 21C1

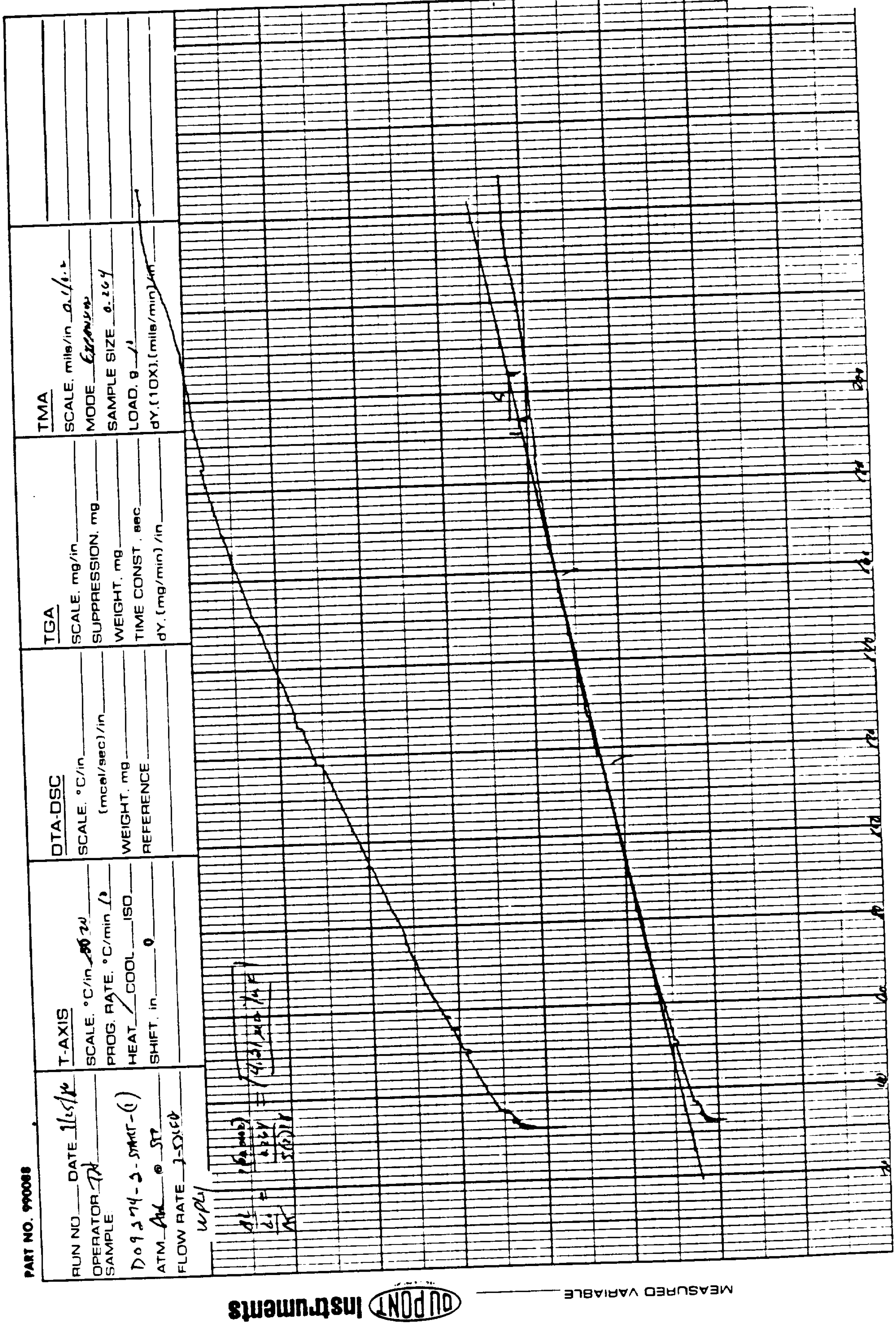


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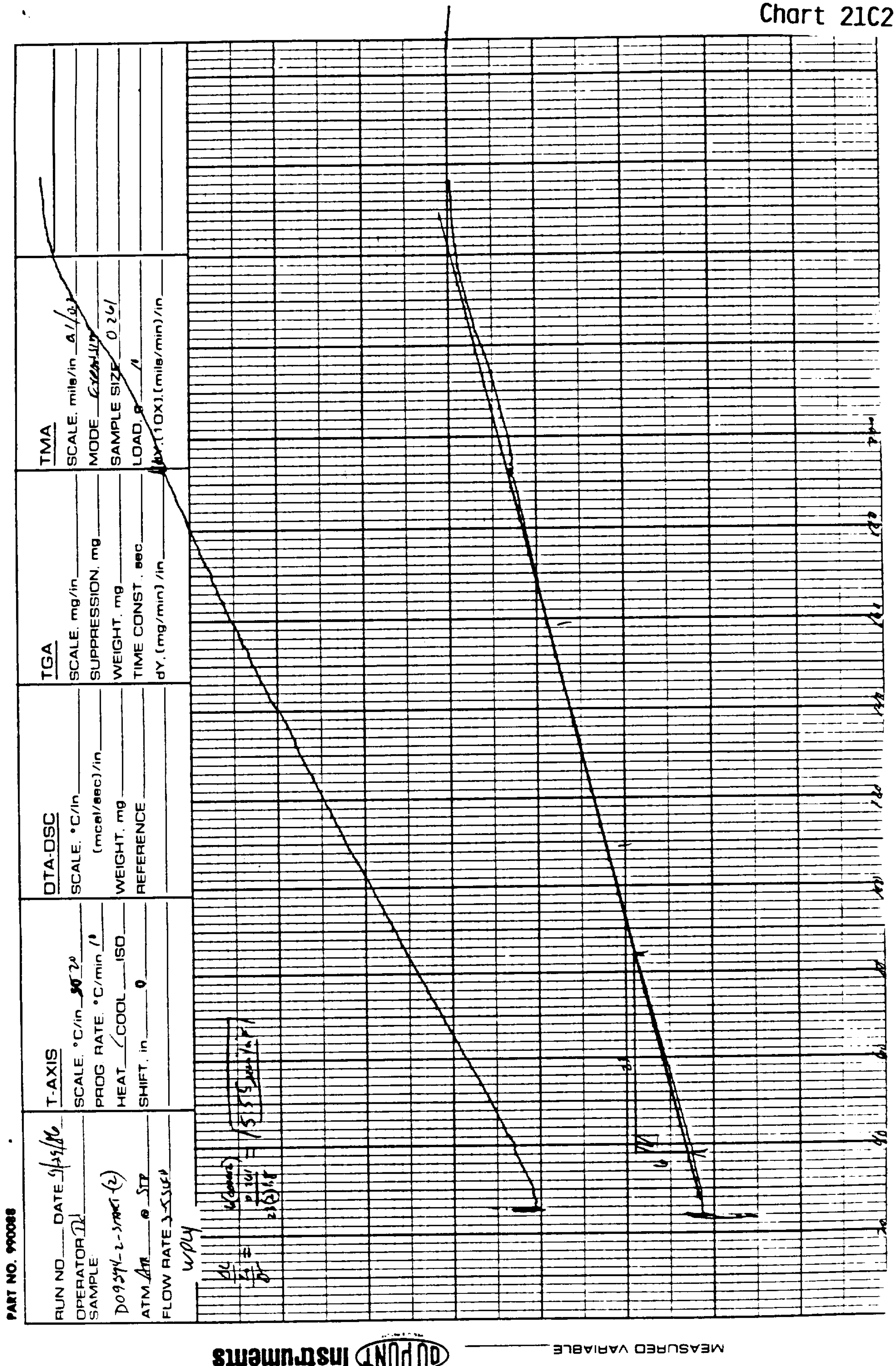
Chart 21C2



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PART NO. 990088

RUN NO.___ DATE 9/24/86	T-AXIS	DTA-DSC	TGA	TMA	
OPERATOR TR	SCALE, °C/in 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/div	
SAMPLE D09274-2-START-(3)	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.148	
ATM Air @ STP	SHIFT, in 0	REFERENCE	TIME CONST., sec	LOAD, g 10	
FLOW RATE 3-5 SCCH			dY, (mg/min)/in	dY,(10X),(mils/min)/in	

X PLY

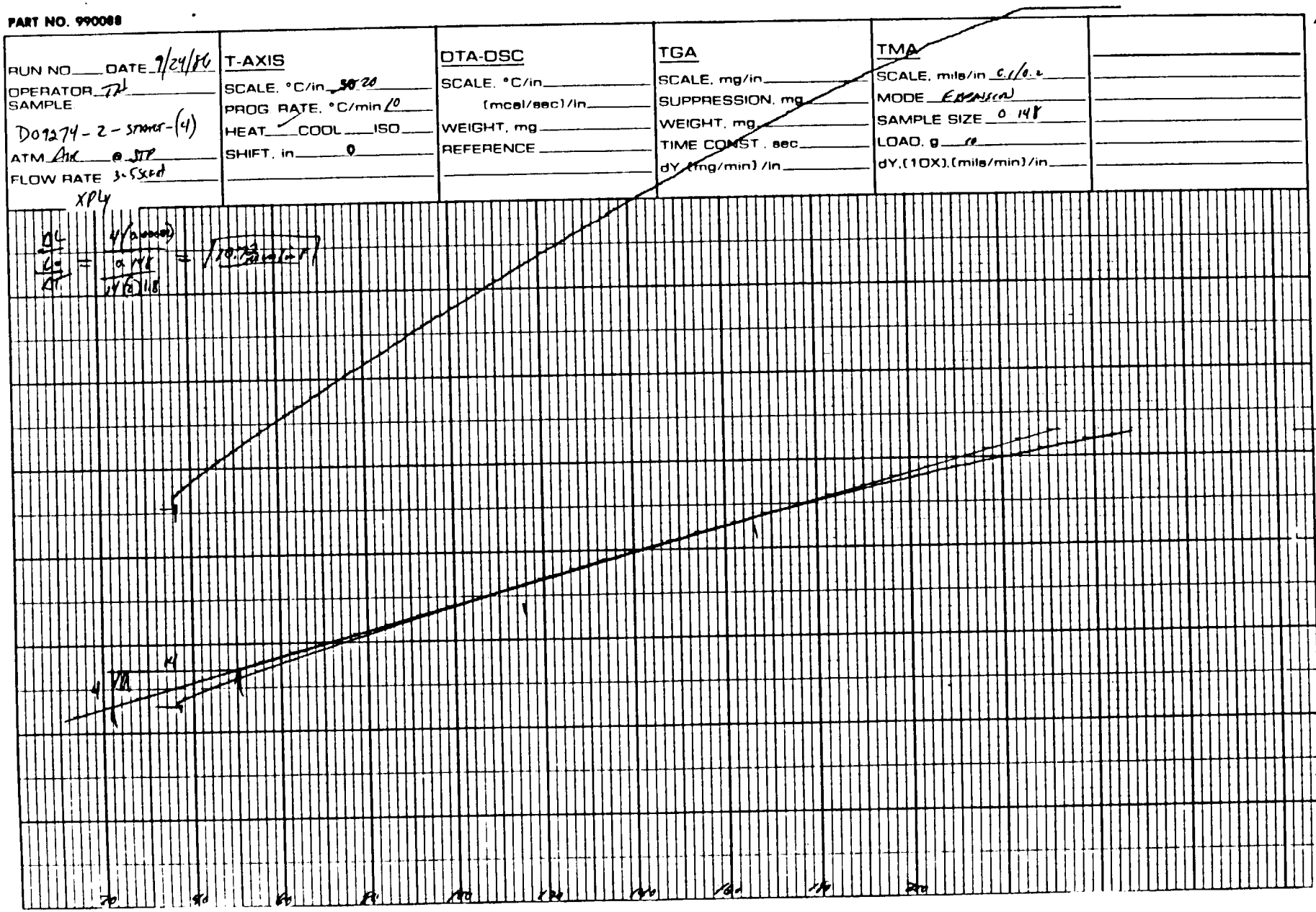
DUPONT Instruments

MEASURED VARIABLE

PART NO. 990088

RUN NO ___ DATE 9/24/86	T-AXIS	DTA-DSC	TGA	TMA	
OPERATOR TL	SCALE, °C/in 50 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
D09274-2-strong-(4)	HEAT ___ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.148	
ATM Air @ STP	SHIFT, in 0	REFERENCE	TIME CONST, sec	LOAD, g 10	
FLOW RATE 3.5 scfd			dY, (mg/min) /in	dY, (10X), (mils/min) /in	

XPL4



MEASURED VARIABLE ___

DUPONT Instruments

PART NO. 990088

RUN NO. ____ DATE 9/23/96

OPERATOR DL

SAMPLE D09574-3-E40 -(1)

ATM Air @ 30°

FLOW RATE 3-5 SCFH

w/PLY

T-AXIS

SCALE, °C/in 50°C

PROG. RATE, °C/min 10

HEAT / COOL ISO

SHIFT, in 0

DTA-DSC

SCALE, °C/in

(mcal/sec)/in

WEIGHT, mg

REFERENCE

TGA

SCALE, mg/in

SUPPRESSION, mg

WEIGHT, mg

TIME CONST., sec

dY, (mg/min) /in

TMA

SCALE, mils/in 0.1/0.2

MODE Expansion

SAMPLE SIZE 0.263

LOAD, g 1

dY, (10X), (mils/min)/in

MEASURED VARIABLE

DUPONT Instruments

Chart 21D2

PART NO. 990088

RUN NO ___ DATE 1/21/94
OPERATOR TH
SAMPLE:
Do 9 294-2-60 -(2)
ATM Air @ SSP
FLOW RATE 3-5SCFU
w/ N2

T-AXIS
SCALE, °C/in 50 20
PROG. RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST ___ sec
dY, (mg/min)/in ___

TMA
SCALE, mil/in 2
MODE Expansion
SAMPLE SIZE 0.266
LOAD, g 10
dY, (10X), (mils/min)/in ___

MEASURED VARIABLE

DU PONT instruments

Chart 21D3

PART NO. 990088

RUN NO ___ DATE 5/14/96
OPERATOR TH
SAMPLE
D01174-2-E00-(3)
ATM Air @ RT
FLOW RATE 3.5 SCFH
X Pin

T-AXIS
SCALE, °C/in 50 20
PROG RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST, sec ___
dY/dT (mg/min)/in ___

TMA
SCALE, mils/in 0.1/0.2
MODE Expansion
SAMPLE SIZE 0.140
LOAD, g 10
dY/dT (10X) (mils/min)/in ___

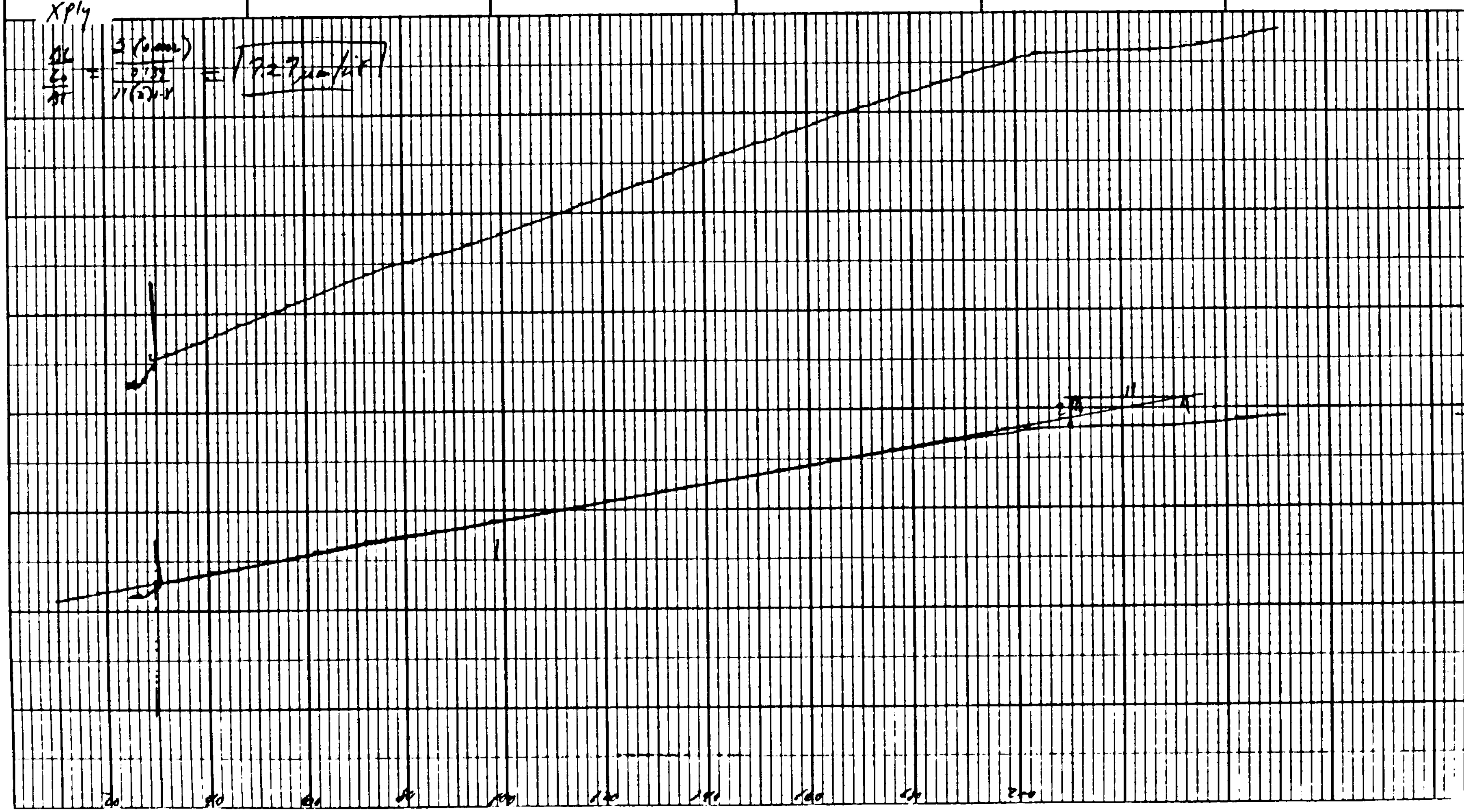
MEASURED VARIABLE

DUPONT instruments

Chart 21D4

PART NO. 990088

RUN NO____ DATE 9/24/86	T-AXIS	DTA-DSC	TGA	TMA	
OPERATOR TH	SCALE, °C/in ~~80~~ 20	SCALE, °C/in____	SCALE, mg/in____	SCALE, mils/in 0.1/0.2	
SAMPLE: D09374-2-END-(4)	PROG. RATE, °C/min 10	(mcal/sec)/in____	SUPPRESSION, mg____	MODE Expansion	
ATM Air @ STP	HEAT ✓ COOL____ ISO____	WEIGHT, mg____	WEIGHT, mg____	SAMPLE SIZE 0.139	
FLOW RATE 2-SSCFH	SHIFT, in 0	REFERENCE____	TIME CONST., sec____	LOAD, g 10	
			dY, (mg/min)/in____	dY, (10X), (mils/min)/in____	



MEASURED VARIABLE

DU PONT Instruments

Chart 21E1

PART NO. 990088

RUN NO ___ DATE 5/21/96
OPERATOR TH
SAMPLE
Dofay-3-spacer-(1)
ATM Air @ STP
FLOW RATE 25 scm
wdry

T-AXIS
SCALE, °C/in 50 20
PROG RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, In 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST, sec ___
dY/dT (mg/min)/in ___

TMA
SCALE, mils/in 2 1/2
MODE Expansion
SAMPLE SIZE 0.262
LOAD, g 2
dY/dT (mils/min)/in ___

MEASURED VARIABLE

DUPONT instruments

Chart 21E2

Chart 21E3

CHART 2164

PART NO. 990088

RUN NO ___ DATE 9/24/86
OPERATOR TH
SAMPLE
D0629A4-3-START-(4)
ATM Air @ STP
FLOW RATE 3 SCFM
X P/7

T-AXIS
SCALE, °C/in 50/20
PROG. RATE, °C/min 10
HEAT ___ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST. sec ___
dY, (mg/min)/in ___

TMA
SCALE, mils/in 0.1/0.2
MODE Expansion
SAMPLE SIZE 0.132
LOAD, g 10
dY, (10X), (mils/min)/in ___

DU PONT Instruments

MEASURED VARIABLE

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Chart 21F1

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Chart 21F2

PART NO. 990088

RUN NO. ___ DATE 1/19/91
OPERATOR DK
SAMPLE
D09274-3-END(2)
ATM Air @ 30cc
FLOW RATE 3-5X61

T-AXIS
SCALE, °C/in 50 20
PROG. RATE, °C/min 10
HEAT / COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in
(mcal/sec)/in
WEIGHT, mg
REFERENCE

TGA
SCALE, mg/in
SUPPRESSION, mg
WEIGHT, mg
TIME CONST., sec
dY/dt (mg/min)/in

TMA
SCALE, mils/in 0.1/0.2
MODE Expansion
SAMPLE SIZE 0.203
LOAD, g 10
dY/dt (10X) (mils/min)/in

DUPONT Instruments

MEASURED VARIABLE